

DAVID JONAS BARDIN

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26 May 2017

Honorable Ken Calvert, Chairman

Honorable Betty McCollum, Ranking Member

Subcommittee on Interior, Environment and Related Agencies

Committee on Appropriations, United States House of Representatives

Re: Unwise proposal to zero out the \$1.9 million USGS Geomagnetism Hazards Program

Dear Chairman Calvert and Ranking Member McCollum,

Please preserve and expand this USGS program in the Department of the Interior (DoI) - rather than zeroing it out as proposed - because the productive outputs of its highly-skilled 15 FTE staff are vital to our national security and critical infrastructure protection. USGS tells you:

"This eliminates the Geomagnetism Program, an element of the U.S. National Space Weather Program. This will reduce the accuracy of NOAA and U.S. Air Force forecasting of the magnitude and impact of geomagnetic storms. In addition to eliminating the data provided to partner Federal agencies, the elimination of the program will also reduce the availability of geomagnetic information to the oil drilling services industry, geophysical surveying industry, several international agencies, and electrical transmission utilities." [See attachment.]

But you learn more from the bipartisan Space Weather Research and Forecasting Act (S. 141), approved by the Senate on May 2, 2017 (see <https://www.congress.gov/bill/115th-congress/senate-bill/141>), which describes and relies on this very USGS program in DoI:

SEC. 60701. SPACE WEATHER.

....

(b) FEDERAL AGENCY ROLES.—

(1) FINDINGS.—Congress finds that—

....

(E) the Department of the Interior collects, distributes, and archives operational ground-based magnetometer data in the United States and its territories, and works with the international community to improve global geophysical monitoring and develops crustal conductivity models to assess and mitigate risk from space weather induced electric ground currents; ... [S. Rept. 115-21 (<https://www.congress.gov/115/crpt/srpt21/CRPT-115srpt21.pdf>).]

Nor does USGS say that this program brings new earth science of modern relevance to the North American Electric Reliability Corporation and the Federal Energy Regulatory Commission.

As a concerned citizen (see attached bio), I believe we will need this program for many years to protect us from both space weather and malevolent risks (such as electromagnetic pulse attacks).

Faithfully, *David Jonas Bardin*

Natural Hazards



	2016	2017	2018				
	Base	CR Annualized	Fixed Costs	Internal Transfer Costs	Program Changes	Request	Change from 2017 Enacted
Natural Hazards	\$139,013	\$138,748	\$1,479	\$0	-\$22,116	\$118,111	-\$20,637
<i>FTE</i>	<i>627</i>	<i>627</i>	<i>0</i>	<i>0</i>	<i>-52</i>	<i>575</i>	<i>-52</i>
Geomagnetism Program	\$1,888	\$1,884	\$0	\$0	-\$1,884	\$0	-\$1,884
<i>FTE</i>	<i>15</i>	<i>15</i>	<i>0</i>	<i>0</i>	<i>-15</i>	<i>0</i>	<i>-15</i>

Summary of Budget Request

The 2018 budget request for the USGS Geomagnetism Program is \$0 and 0 FTE, a change of -\$1,884,000 and -15 FTE from the 2017 Annualized Continuing Resolution (CR) level.

Overview

Magnetic storms are caused by the dynamic interaction of the Earth's magnetic field with the Sun. While magnetic storms often produce beautiful aurora lights that can be seen at high latitude, they can also wreak havoc on the infrastructure and activities of our modern, technologically based society. Large storms can induce voltage surges in electric-power grids, causing blackouts and the loss of radio communication, reduce GPS accuracy, damage satellite electronics and affect satellite operations, enhance radiation levels for astronauts and high-altitude pilots, and interfere with directional drilling for oil and gas.

In order to understand and mitigate geomagnetic hazards, the USGS Geomagnetism Program has monitored and analyzed the Earth's dynamic magnetic field. The Program is part of the U.S. National Space Weather Program (NSWP), an interagency collaboration that includes programs in the National Aeronautics and Space Administration (NASA), the Department of Defense (DOD), the National Oceanic and Atmospheric Administration (NOAA), and the National Science Foundation (NSF). The Geomagnetism Program provides data to the NSWP agencies, oil drilling services companies, geophysical surveying companies, and several international agencies. USGS data, products, and services are also used by the electric-power industry to evaluate geomagnetic storm risk.

Domestically, the USGS works cooperatively with NOAA, the Air Force 557th Weather Wing, and other agencies. For example, USGS observatory data are used by NOAA's Space Weather Prediction Center,

U.S. Geological Survey

2018 Budget Justification

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Natural Hazards

and by the U.S. Air Force, for issuing geomagnetic warnings and forecasts. The USGS magnetic observatory network is part of the global INTERMAGNET network. USGS research is conducted in collaboration with the Colorado School of Mines, the USGS Crustal Geophysics and Geochemistry Science Center, the NOAA/SWPC, and the NASA Community Coordinated Modeling Center.

The USGS also works with private entities that are affected by space weather and geomagnetic activity, including electric-power grid companies and the oil and gas drilling industries. In the oil and gas industry, for example, drill operators need to know which way their drill bits are going to maximize oil production and avoid collisions with other wells. One way to accomplish this important task is to *install a magnetometer*—a sort of modern-day "compass"—in a drill-string instrument package that follows the drill bit. Simultaneous measurements of the magnetic field in the drill hole are combined with those monitored by the USGS to produce a highly accurate estimate of the drill bit position and direction.

2018 Program Changes

Eliminate the Geomagnetism Program. (-\$1,884,000/-15 FTE): This eliminates the Geomagnetism Program, an element of the U.S. National Space Weather Program. This will reduce the accuracy of NOAA and U.S. Air Force forecasting of the magnitude and impact of geomagnetic storms. In addition to eliminating the data provided to partner Federal agencies, the elimination of the program will also reduce the availability of geomagnetic information to the oil drilling services industry, geophysical surveying industry, several international agencies, and electrical transmission utilities.

Science Collaboration

The USGS is a member of the multiagency NSWP. Domestically, the USGS works cooperatively with NOAA, the Air Force 557th Weather Wing, and other agencies. For example, USGS observatory data are used by NOAA's Space Weather Prediction Center, and by the U.S. Air Force, for issuing geomagnetic warnings and forecasts. Internationally, the USGS magnetic observatory network is itself part of the global INTERMAGNET network. USGS research is conducted in collaboration with the Colorado School of Mines, the USGS Crustal Geophysics and Geochemistry Science Center, the NOAA/SWPC, and the NASA Community Coordinated Modeling Center.

The USGS also works with private entities that are affected by space weather and geomagnetic activity, including electric-power grid companies and the oil and gas drilling industries. In the oil and gas industry, for example, drill operators need to know which way their drill bits are going to maximize oil production and avoid collisions with other wells. One way to accomplish this important task is to install a magnetometer—a sort of modern-day "compass"—in a drill-string instrument package that follows the drill bit. Simultaneous measurements of the magnetic field in the drill hole are combined with those monitored by the USGS to produce a highly accurate estimate of the drill bit position and direction.

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Mr. Bardin, a retired member of Arent Fox LLP, has focused on energy, environmental, public utility, and governance issues in a number of public and private capacities.

- At Arent Fox beginning in 1980, he practiced energy, public utilities, and environmental law on behalf of corporate and governmental clients in the United States and abroad.
- As a private citizen, he addressed energy issues involving public information, research and development, incentives for enhanced oil recovery and carbon dioxide sequestration, unconventional petroleum resources (including Bakken oil resources of the Williston Basin¹), and District of Columbia and regional government matters (including the University of the District of Columbia).

He served as Deputy Administrator of the Federal Energy Administration (1977) and Administrator of the Economic Regulatory Administration of the Department of Energy (1977-79), under appointments by President Carter, and as New Jersey's cabinet-level Commissioner of Environmental Protection (1974-77) under appointment by Governor Byrne. He worked in Israel (1970-74) on public utility and environmental matters. He held federal civil service positions (1958-69) as trial attorney, assistant general counsel for legislation, and deputy general counsel at the U.S. Federal Power Commission (now FERC) during the Eisenhower, Kennedy, Johnson, and Nixon Administrations, and did active duty as an enlisted man in the U.S. Army Transportation Research & Engineering Command (1956-58).

He served on the Board of Directors of the District of Columbia Water and Sewer Authority (DC Water or DCWASA) for over 10½ years (2001-2011), during the administrations of Mayors Williams, Fenty, and Gray. He chaired the Board's committee on retail water and sewer rates and its subcommittee overseeing development of the Combined Sewer Overflow Long Term Control Plan. Prior to Board appointment, he served on DCWASA's Stakeholder Advisory Committee for that Plan. He served as an elected Advisory Neighborhood Commissioner for District 3F04 for three terms (1999-2004). He has served on the DC Building Codes Advisory Committee and DC Zoning Advisory Committee.

Bardin is a graduate of Columbia University Law School (1956), Columbia College (1954), and the Bronx High School of Science (1950). He and his wife, Livia, have four children and five grandchildren.

December 7, 2014

¹ See <http://undeerc.org/News-Publications/Leigh-Price-Paper/Default.aspx> (Leigh Price Papers & New Correspondence Regarding the Bakken Formation); Bardin, *Avoiding US oil resource surprises requires enhanced information system* (Oil & Gas Journal, 11/5/2012).