

Supplement to General Information Product 263

“The USGS: An Unparalleled Scientific Asset”

Information Sources for General Information Product 263

Each section of the information sheet is listed below, followed by the bibliographic reference or references for the information in each section.¹

For further information, visit: <http://www.usgs.gov>.

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Mapping the Nation

\$21B—Geologic maps save users an estimated 15% in annual costs: a value of between \$14B and \$21B.

Berg, R.C., and Faulds, J.E., eds., 2025, Economic analysis of the costs and benefits of geological mapping in the United States of America from 1994 to 2019: Alexandria, Va., American Geosciences Institute, 169 p., accessed September 22, 2025, at <https://doi.org/10.62322/wra5.gs9v>.

\$25.6B is the annual value to users of key Earth observation platforms like Landsat, which is managed by the USGS.

Loomis, J.B., Koontz, S.R., and Ravichandran, A., 2024, Economic valuation of Landsat and Landsat Next (2023): U.S. Geological Survey report, prepared under contract by authors through direction of Native American Technology Corporation, Leesburg, Va., 123 p., accessed September 22, 2025, at <https://www.usgs.gov/media/files/economic-valuation-landsat-and-landsat-next-2023>.

\$13.5B in annual benefits is generated by the USGS's 3D Elevation Program.

Dewberry Engineers Inc., 2022, 3D Nation elevation requirements and benefits study: National Oceanic and Atmospheric Administration report, prepared by Dewberry Engineers Inc., 171 p., 13 app. (A–M), accessed September 22, 2025, at <https://www.dewberry.com/services/geospatial-mapping-and-survey/3d-nation-elevation-requirements-and-benefits-study>. [Also available at <https://www.usgs.gov/3d-elevation-program/3d-nation-elevation-requirements-and-benefits-study>.]

Securing America's Energy Independence

44%—USGS-identified undiscovered geothermal energy is equal to 44% of current U.S. electricity generation.

²U.S. Energy Information Administration [EIA], 2025, Electric power monthly—Table 6.1. electric generating summer capacity changes ([megawatts] MW), May 2025 to June 2025: EIA website, accessed September 22, 2025, at https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_6_01.

³Williams, C.F., Reed, M.J., Mariner, R.H., DeAngelo, J., Galanis, S.P. Jr., 2008, Assessment of moderate- and high-temperature geothermal resources of the United States: U.S. Geological Survey Fact Sheet 2008–3082, 4 p., accessed September 22, 2025, at <https://doi.org/10.3133/fs20083082>.

¹Values are given in billions (B) and millions (M) of U.S. dollars. GDP is “Gross Domestic Product.” Percentages are shown as %.

²The total electric-generating summer capacity at the end of May 2025, at utility-scale facilities, was 1,247,078 megawatts.

³This assessment indicates the availability of a combined 548,000 megawatts-electric of (1) undiscovered geothermal power generation and (2) an additional undiscovered geothermal potential is available through the application of enhanced geothermal systems technology.

29.4B barrels of oil and 391.6 trillion cubic feet of gas in recoverable resources are available on U.S. public lands based on USGS assessments.

Schenk, C.J., Mercier, T.J., and 1995–2025 National and Global Oil and Gas Assessment Project Federal Lands Resource Allocation Team, 2025, An estimate of undiscovered, technically recoverable oil and gas resources underlying Federal lands of the onshore United States, 2025: U.S. Geological Survey Fact Sheet 2025–3032, 6 p., accessed September 22, 2025, at <https://doi.org/10.3133/fs20253032>.

Protecting Americans' Health and Safety

\$424B in recent wildland fire damages highlight the need for USGS fire science, which supports efforts to protect communities and reduce risk.

Crowley, C., Miller, A., Richardson, R., and Malcom, J., 2022, Increasing damages from wildfires warrant investment in wildland fire management: U.S. Department of the Interior, Office of Policy Analysis Brief B–2023–01, 2 p., accessed September 22, 2025, at <https://www.doi.gov/sites/doi.gov/files/ppa-brief-wildland-fire-econ-review-2023-05-25.pdf>.

USGS earthquake, volcano, landslide, and coastal hazard monitoring and information save lives and minimize costs; for example, \$2.8M can be saved because of USGS enhanced information about a Mauna Loa eruption.

Pindilli, E., and Avery, V., 2018, The value of USGS science—Volcano science Mauna Loa eruption scenario use case, AGU 100—Advancing Earth and Space Science, Washington, D.C., 10–14 December 2008: American Geophysical Union Fall Meeting 2018, abstract no. PA33B–34, accessed September 22, 2025, at <https://ui.adsabs.harvard.edu/abs/2018AGUFMPA33B..34P/abstract>.

\$4.5B is the estimated cost of annual flooding. Through a network of over 11,885 streamgages, the USGS supports public safety and enables forecasts, early warning systems, and management actions that protect lives and property.

National Oceanic and Atmospheric Administration National Centers for Environmental Information [NOAA NCEI], 2025, U.S. billion-dollar weather and climate disasters: NOAA NCEI website, accessed September 22, 2025, at <https://www.ncei.noaa.gov/access/billions/>.

Supporting National Security

\$3.1B—The USGS identified a \$3.1B risk to the American economy if China restricts gallium imports. This is one example underscoring the importance of the USGS mapping critical minerals, investigating supply chains, and producing the Nation's critical minerals list.

Nassar, N.T., Shojaeddini, E., Alonso, E., Jaskula, B., and Tolcin, A., 2024, Quantifying potential effects of China's gallium and germanium export restrictions on the U.S. economy: U.S. Geological Survey Open-File Report 2024–1057, accessed September 22, 2025, at <https://doi.org/10.3133/ofr20241057>.

Enhancing Our Lands and Waters

\$21B in estimated annual costs results from invasive species. The USGS's invasive species research informs approaches used to reduce their effects on agriculture, water infrastructure, disease transmission, fisheries, and outdoor recreation.

Fantle-Lepczyk, J.E., Haubrock, P.J., Kramer, A.M., Cuthbert, R.N., Turbelin, A.J., Crystal-Ornelas, R., Diagne, C., Courchamp, F., 2022, Economic costs of biological invasions in the United States: Science of The Total Environment, v. 806, pt. 3, accessed September 22, 2025, at <https://doi.org/10.1016/j.scitotenv.2021.151318>.

USGS innovations support early warnings for harmful algal blooms—over \$2M in yearly benefits are provided to Kansas alone.

Pindilli, E., and Loftin, K., 2022, What's it worth? Estimating the potential value of early warnings of cyanobacterial harmful algal blooms for managing freshwater reservoirs in Kansas, United States: *Frontiers of Environmental Science*, v. 10, article 805165, accessed September 22, 2025, at <https://doi.org/10.3389/fenvs.2022.805165>.

\$45B—USGS science informs the management of big game (such as deer and elk). The big-game hunting industry contributes \$45B to the U.S. economy.

U.S. Fish and Wildlife Service, 2023, 2022 National survey of fishing, hunting, and wildlife-associated recreation: U.S. Fish and Wildlife Service report, 87 p., accessed September 22, 2025, at https://www.fws.gov/sites/default/files/documents/Final_2022-National-Survey_101223-accessible-single-page.pdf.

Fostering American Prosperity

\$4.1T—Mineral commodities are necessary for the \$4.1T in value added to the GDP by major industries that consume processed mineral materials and employ 1 million workers. Because of this, USGS data on mineral supply, demand, and trade are highly valued.

U.S. Geological Survey, 2025, Mineral commodity summaries 2025 (ver. 1.2, March 2025): U.S. Geological Survey, accessed September 22, 2025, at <https://doi.org/10.3133/mcs2025>.

45,000 metric tons—Rare earths power the growing technology economy, including cell phones, electric vehicles, and medical devices. For over 70 years, USGS work has supported the discovery of rare earth resources in California's Mountain Pass area, which produced 45,000 metric tons of rare earth concentrates in 2024—over 11% of the global supply.

California Curated, 2025, The Mountain Pass Mine in California may be the U.S. rare earths game changer: California Curated website, January 29, 2025, accessed September 22, 2025, at <https://californiacurated.com/2025/01/29/the-mountain-pass-mine-in-california-may-be-the-u-s-rare-earths-game-changer/>.

⁴Cordier, D.J., 2025, Rare earths: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 144–145, accessed September 22, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-rare-earths.pdf>.

U.S. Geological Survey, [2025], Mountain Pass, California—Publications by USGS authors: U.S. Geological Survey website, accessed September 22, 2025, at <https://www.usgs.gov/centers/gmeg/mountain-pass-california-publications-usgs-authors>.

Guarding American Food Security

\$70.2B—USGS science informs early warning systems and management strategies to mitigate disease outbreaks in agriculture—critical research on highly pathogenic avian influenza, for example, helps safeguard the \$70B value in poultry and egg production.

U.S. Department of Agriculture Economic Research Service [USDA ERS], 2025, Poultry and eggs—Sector at a glance (updated June 25, 2025): USDA ERS website, accessed September 22, 2025, at <https://www.ers.usda.gov/topics/animal-products/poultry-eggs/sector-at-a-glance>.

\$11.8B—USGS groundwater tools are vital for agriculture; for example, in the Mississippi Alluvial Plain, 65% of farming relies on groundwater to support its \$11.8B annual industry.

Alhassan, M., Lawrence, C.B., Richardson, S., and Pindilli, E., 2019, The Mississippi Alluvial Plain aquifers—An engine for economic activity: U.S. Geological Survey Fact Sheet 2019–3003, 4 p., accessed September 22, 2025, at <https://doi.org/10.3133/fs20193003>.

⁴Percentage of global supply calculated from U.S. production divided by global production was obtained from this source.

