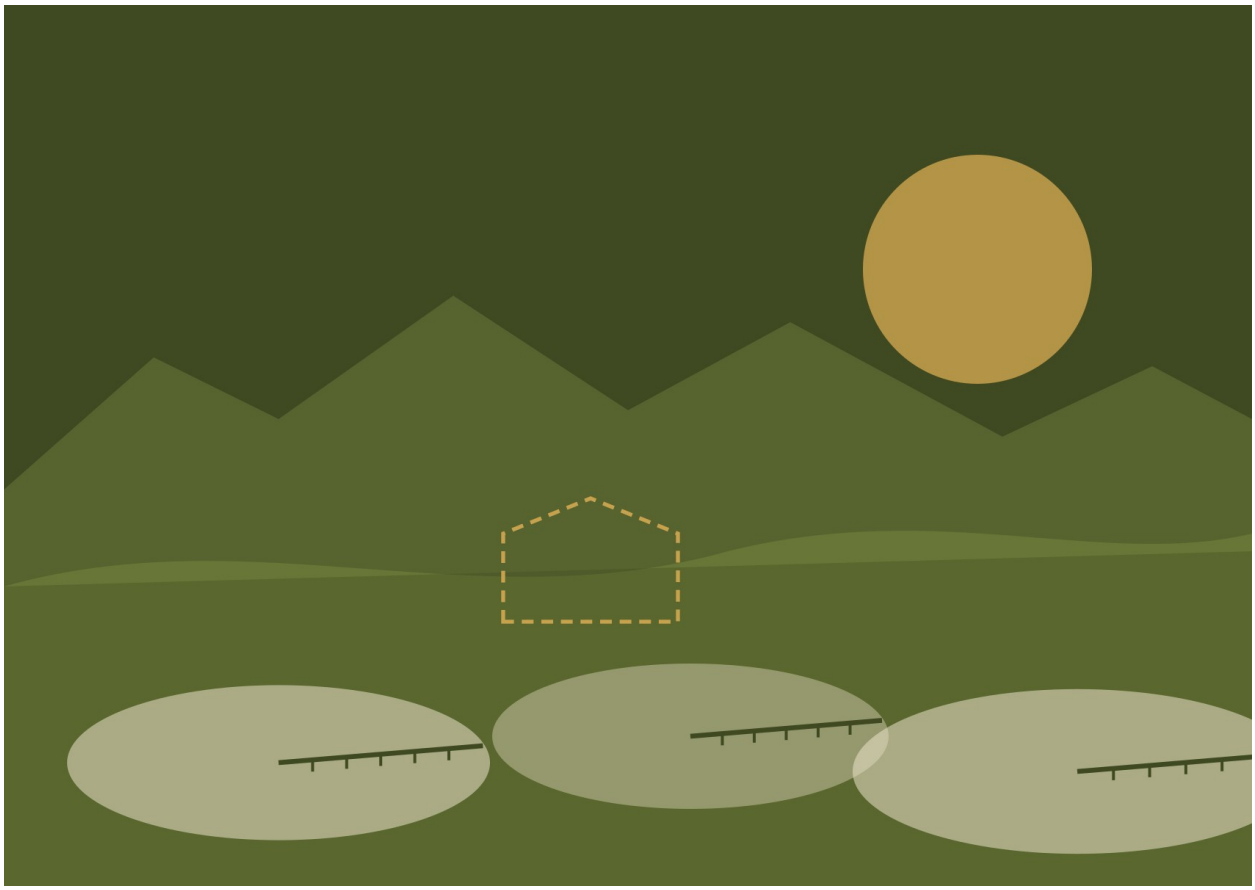


IDAHO DATA CENTER PUBLIC GUIDE · GUIDE 4 OF 9

FARMLAND, PUBLIC LAND AND BIG PROJECTS

Farmland Doesn't Come Back Easy

What happens to farm ground and sagebrush after solar, wind and data center projects are built and torn down, and why Idaho should keep them off its best land in the first place.

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AT A GLANCE

The short version

Once thousands of acres are covered with concrete, roads, steel, power lines, server buildings, solar panels or wind turbines, getting that ground back is neither easy nor cheap. Studies of solar sites, wind farms and pipelines all find the same thing. Heavy equipment packs the soil down, mixes up the layers and wrecks drainage, and yields can stay low for years after the work is done. Sagebrush is worse. On old oil and gas well pads in Wyoming, researchers estimated sagebrush cover took at least 87 years to come back on its own. We found no case anywhere of a torn-down data center campus going back to irrigated farming at its old yields. And Idaho is already losing farmland at a steady clip. So the honest answer is to put these projects somewhere else: on land that's already disturbed, already industrial, or already paved.

144,000
acres of Idaho farmland lost from 2017 to 2022 (USDA Census of Agriculture)

2,119
Idaho farms gone in those five years, more than one a day

20–40%
lower crop yields for 3 to 5 years expected even after deep tillage of an old solar site (NC State Extension)

0
documented cases of a torn-down data center campus returning irrigated farmland to its old yields

Inside this guide

01 Idaho is already losing farmland
02 Why southern Idaho's soil is worth protecting
03 What heavy construction does to the ground
04 Sagebrush and public land
05 There are better places to build
06 What you can do
07 Words to know and where to look
08 Sources

How to read the numbers

MEASURED means field or satellite data from a study or agency. PROMISE means what a permit, lease or plan says will happen, something to check later and not proof. EXAMPLE means a sample permit rule you can adapt.

HOW THIS GUIDE WAS CHECKED

Every study and agency report cited here was checked against the original in November 2026. The farmland loss figures are from the 2022 Census of Agriculture as reported by USDA and the Idaho Farm Bureau. Where a study measured something narrower than the headline suggests, the guide says so.

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PART 01

Idaho is already losing farmland

Southern Idaho doesn't have farmland to spare, and its irrigated ground is some of the most productive in the country.

From 2017 to 2022, Idaho lost **144,000 acres** of working farm and ranch land, a 1.2 percent drop to about 11.55 million acres. It lost **2,119 farms**, 8.5 percent of the total, more than one a day. The country as a whole lost about 20 million acres, 2.2 percent, and 6.9 percent of its farms.[1] Idaho lost farms faster than the nation did.

Most of that land went to houses and growth. Now hyperscale data centers and the solar and wind projects built to power them want hundreds or thousands of acres at a time. A single project of that size can change life for a whole rural community: the roads, the water, the noise and the neighbors.

> IT HAPPENED ON FARMLAND IN MICHIGAN
>
> In September 2025, the Saline Township board voted 4–1 to deny rezoning **575 acres of farmland** for an Oracle and OpenAI data center. Two days later the developer and the landowner sued, calling the township's zoning "exclusionary." Facing possible money damages, the board settled in October after a closed-door meeting. The project went ahead in exchange for $14 million, including $4 million for farmland preservation, plus a promise to restore the site if it ever shuts down.[2]
>
> Part of the developer's argument was that the township had almost no land zoned for industry. Counties that write clear rules ahead of time are in a stronger spot.

[1] USDA, 2022 Census of Agriculture; Idaho Farm Bureau Federation, "Idaho loses 144,000 acres of farmland" and "Ag Census shows Idaho lost 2,119 farms," 2024.

[2] Planet Detroit, Oct. and Dec. 2025; Route Fifty / Inside Climate News, Oct. 26, 2025; Michigan Advance, Oct. 30, 2025.

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PART 02

Why southern Idaho's soil is worth protecting

The ground under southern Idaho's farms took tens of thousands of years to build, and most of it is only prime farmland when it gets water.

How it formed

Start with the volcanoes. The hotspot now under Yellowstone crossed southern Idaho over millions of years, and basalt lava filled the Snake River Plain behind it. Lakes, including ancient Lake Idaho in the west, left layers of fine sediment. Then came the ice. Glaciers ground up central Idaho's mountains and the Yellowstone plateau, meltwater carried the silt out onto the plain, and strong winds blew it east into deep drifts of wind-blown silt called loess. Idaho State University's geologists put it plainly: this loess "is now the rich soil that grows the Famous Potatoes."[3]

Scientists have dated those dust layers. Most of the loess on the plain blew in during the last ice age, between roughly 42,000 and 11,000 years ago, and it piled up fastest from about 25,000 to 17,000 years ago. At the peak, the eastern plain gained about two feet every thousand years. The central plain, closer to the Magic Valley, gained it about three times more slowly.[4]

What makes it different

The common farm soil of the Magic Valley is a silt loam made of that dust laid over lava. The USDA's official description of the Portneuf series, first described in Minidoka County, says it formed in loess, gets about 9 inches of rain a year and has a hard, limy layer starting 6 to 15 inches down. The same description calls the series extensive in southern Idaho and lists potatoes, sugar beets, beans, small grains and hay as its main crops.[5]

- ☐ **It's desert soil that farms like prime ground only with water.** Left alone it grows sagebrush and bunchgrass. With water, it's the backbone of Idaho farming: Idaho State University's Digital Atlas says this dry, limy soil covers most of the state's roughly 3.5 million irrigated acres and grows more than half its field crops.[6]
- ☐ **The good layer is thin.** USDA researcher David Carter at the Kimberly research center found about 15 inches of topsoil over the white lime hardpan on these fields. Wheat yields fell about 3.5% for every inch of topsoil lost. Adding soil above the original 15 inches didn't raise yields.[7]
- ☐ **It washes away easily and comes back slowly.** A University of Idaho bulletin calls these high-silt soils extremely susceptible to erosion and says land grading has already stripped topsoil in places.[8] University of Idaho Extension says a single inch of soil may take many hundreds of years to form.[9]
- ☐ **It sits on the aquifer.** The same basalt under the soil holds the Eastern Snake River Plain Aquifer (ESPA), which feeds the springs and wells these farms depend on.[10]

[3] USDA NRCS, Conservation Considerations for Solar Farms, Mar. 2024.

[4] NC State Extension, Craven County Center, "Can Solar Energy Production Be Converted to Farmland?" (updated July 2025).

[5] C. Emenhiser, Post Windfarm Installation Impacts on Soil Properties and Crop Response in the Midwest, M.S. thesis, Purdue University, 2020.

[6] Idaho Code §§ 42-222, 42-223; IDWR, Water right transfers.

[7] Idaho H.B. 895 (2026), Idaho Code § 42-252.

[8] Avirmed, O., et al. (2015). Sagebrush steppe recovery on 30–90-year-old abandoned oil and gas wells. Ecosphere.

[9] Root, Brinda and Dodson, Biogeosciences 14 (2017): 3957–3969.

[10] Executive Order 14318, Accelerating Federal Permitting of Data Center Infrastructure, 90 Fed. Reg. (July 23, 2025).

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WHAT THAT MEANS FOR A DATA CENTER SITE

Heavy equipment packs silt soils and mixes the layers (Part 03). On ground where the good layer is about 15 inches thick over a lime hardpan, there isn't much to spare. And since July 1, 2026, a new data center can't evaporate that farm's irrigation water in its cooling towers unless the water comes through a city, water district or water and sewer district system (Idaho Code § 42-252). Whoever controls the land during the project has to keep the farm's water right in use, or it can be lost.

PART 03

What heavy construction does to the ground

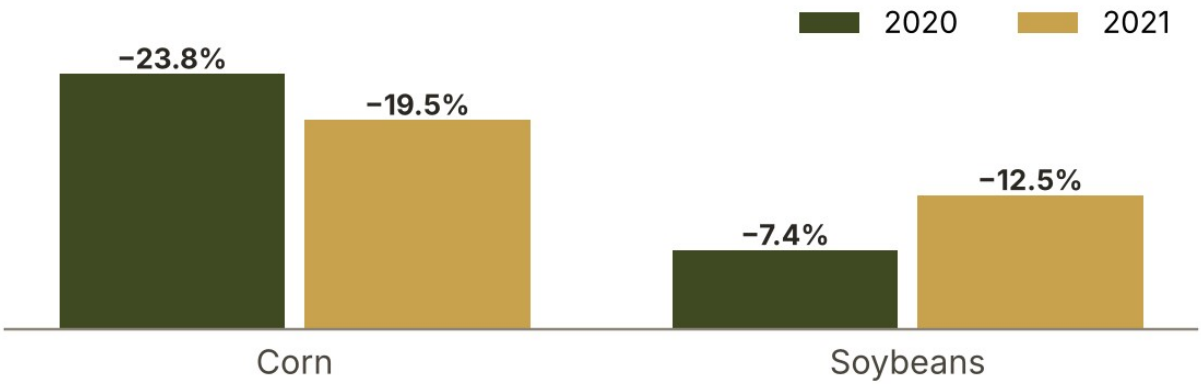
Clearing the equipment away is one thing. Growing a full crop on that ground again is another.

Solar. The USDA's Natural Resources Conservation Service lists soil compaction, erosion, standing water, contamination and loss of organic matter as concerns at utility-scale solar sites. Its March 2024 guidance says construction methods, protecting topsoil and managing plant cover are what keep the land farmable.[11] North Carolina State University's extension office, which works with farmers directly, says plainly that the idea solar land can easily go back to farming "is not always valid." Even with deep tillage, it says to expect **20 to 40 percent lower yields for 3 to 5 years** while compaction works itself out, and that for some questions no data exists yet.[12]

Wind. A Purdue University study of two Indiana wind farms found construction damaged about **4.4 acres per turbine** in the first year. The damaged area shrank over time, but on poorly drained, fine-textured soils it still hadn't recovered after three years.[13]

Pipelines. These are the closest thing to a measured warning. On 29 Ohio farm sites, corn and soybean yields over buried pipelines were still well below neighboring ground after the companies' 4-to-5-year cleanup period ended and the land was called restored.

MEASURED · Crop yield over pipelines compared with untouched ground next to them



Brehm and Culman (2023), Soil Science Society of America Journal 87(2). Measured after the companies considered the land restored.

A data center campus is a much bigger disturbance than a pipeline trench: buildings, paved pads, substations, buried lines and foundations. We searched for a campus that sat on productive farmland, was

[11] Quorum, "Quorum Tracked 486 Data Center Measures in 2025–2026. Only 42 Became Law," Oct. 26, 2026; NCSL, "As They Consider New Data Centers, States Target Water Use," 2026; Florida CS/CS/SB 484 (2026).

[12] Idaho State University, Digital Geology of Idaho, "Snake River Plain Topographic Development."

[13] "Dates and rates of loess deposition and soil formation on the Snake River Plain, Idaho, USA," GSA Bulletin 138(9–10), 2026 (Idaho Geological Survey and partners; LLNL-JRNL-2020543).

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torn down, and then grew normal crops again. We found none. What exists so far are promises written into permits.

Water is part of the farm

In Idaho, rebuilt pivots are worth little without water to run them. Five years of not using a water right can put it at risk of being lost, with some exceptions.[14] Since July 1, 2026, a new data center also can't use up water for cooling unless it comes from a city, water district or water and sewer district system, so a farm's own irrigation right can't become a data center's cooling supply.[15] Any closure plan should show who keeps the farm's water right alive while the project runs.

Few states have a rule like this. Most data center water laws passed by October 2026 only require reports, as in Utah and California, and Florida tied big permits to reclaimed water. A second Idaho law took effect the same day: H.B. 911 (Idaho Code § 61-335) requires a PUC-approved contract and a no harm test before a utility serves a new customer of 50 megawatts or more.[16]

PART 04

Sagebrush and public land

Public lands belong to all of us. Once native sagebrush is scraped off, it comes back on its own clock, and that clock is measured in generations.

On 29 abandoned oil and gas well pads in Wyoming, left without cleanup between 1923 and 1980, researchers estimated it takes **at least 87 years** for big sagebrush cover to recover naturally. Many of the wildflowers that make up most of the plant variety showed little sign of coming back at all.[17] In Idaho, the living crust on the soil surface was still far behind unburned ground 12 to 16 years after wildfires.[18] And the recovery clock doesn't start until the project is fully removed.

Cheatgrass and other invasive weeds move into scraped ground fast. Once they take over, they feed bigger and more frequent fires, which push sagebrush back even further.

PART 05

There are better places to build

Before anyone gives up farmland or public land, the developer should have to show it seriously looked at land that's already been used.

That means old industrial sites and brownfields, former mines, closed or underused military land, land next to existing substations, and areas already zoned for industry. The federal government is pointing the same direction. Executive Order 14318, signed July 23, 2025, tells federal agencies to identify brownfields, Superfund sites and suitable federal land, including military and Energy Department sites, for data centers and the power plants that serve them.[19] Not every alternative will work. Checking should be the first step, not an afterthought.

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[14] USDA Natural Resources Conservation Service, Official Soil Series Description, Portneuf series.

[15] Idaho State University, Digital Atlas of Idaho, "Idaho Soils."

[16] D.L. Carter, USDA-ARS Snake River Conservation Research Center, Kimberly, as summarized in Pacific Northwest STEEP, "Crop Yields Decline with Topsoil Loss."

[17] W.W. Rasmussen and J.W. Cary, White Spot, Deep Tillage and Water Infiltration of the Portneuf and Related Silt Loam Soils, University of Idaho Current Information Series No. 460, 1979.

[18] University of Idaho Extension soils publications (uiext24670, uiext27334).

[19] "Dates and rates of loess deposition and soil formation on the Snake River Plain, Idaho, USA," GSA Bulletin 138(9–10), 2026 (Idaho Geological Survey and partners; LLNL-JRNL-2020543).

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A developer should also have to say plainly what the project is for and whom it serves. A data center for hospitals, banks, 911 dispatch or national defense is different from one built for ad targeting, crypto mining or AI capacity with no signed customer. The second kind is a poor reason to pave over a working farm.

If a county allows it anyway, make the promise testable

What to require	Before construction	Before the bond is released
Soil	Map topsoil depth and layers on every part of the site	Topsoil back to at least its old depth; packed layers broken up
Water	Record the water rights, wells, pivots and drains	Water delivered and drains working; the right still valid
Cleanup	List every foundation, road and buried line	Concrete and pavement removed to the agreed depth; soil tested
Crops	Recent yield history for the fields	Normal yields compared with nearby ground for several seasons
Money	An independent cost estimate in today's dollars	Bond held until the field is producing again

EXAMPLE · A BOND THAT MEANS SOMETHING

Hold back the last of the cleanup bond until restored ground produces at least **90 percent** of what matched nearby ground produces for **three** growing seasons. Set the bond at **150 percent** of an independent cleanup estimate, with no credit for the scrap value of the equipment. An $18 million estimate would mean a $27 million bond. These are sample numbers a county can adopt or adjust.

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PART 06

What you can do

WHERE WE STAND

Our farmland feeds people. Our public lands belong to all of us. Neither should be treated as disposable. Ban hyperscale data centers and the energy projects built for them on farmland, near homes and on public land. Put them on ground that's already industrial or already disturbed.

Ask your county commissioners

- ☐ Will you write zoning rules for data centers and large energy projects now, before an application arrives?
- ☐ Will you require developers to show which already-disturbed sites they considered, and why they turned them down?
- ☐ Will you require developers to say what the project is for and who the customer is?
- ☐ Will you require conflict-of-interest disclosures, public hearings and an independent technical review for every big project?
- ☐ Will you require a cleanup bond held until the land is producing again, not just cleared?

Check any parcel yourself

Look up the soil and farmland rating for any piece of ground at **websoilsurvey.nrcs.usda.gov**. Look up its water rights at **idwr.idaho.gov**.

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PART 07

Words to know

Baseline. Measurements taken before construction, used to judge whether the land really recovered.

Brownfield. Land that was used for industry and may be contaminated, often a good place to rebuild.

Cleanup bond. Money a developer puts up front so the county can restore the site if the company doesn't.

Compaction. Soil packed down by heavy equipment so roots and water can't get through.

Decommissioning. Shutting down a facility and taking out its equipment.

ESPA. The Eastern Snake River Plain Aquifer, which supplies much of southern Idaho's groundwater.

Hardpan. A hard layer below the topsoil, in southern Idaho usually cemented with lime, that roots and water get through slowly.

Hyperscale. The biggest class of data centers and the energy projects built to serve them, often hundreds or thousands of acres.

Loess. Fine silt carried by wind and laid down in deep drifts. Most southern Idaho farm soil formed in it.

Prime farmland. Land the USDA rates as having the best soil, water and climate for crops.

Silt loam. A soil made mostly of fine silt with some sand and clay. It holds water well and erodes easily.

Topsoil. The top, most productive layer of soil.

Water right forfeiture. Losing a water right by not using it for a period set by law.

Where to look it up

USDA Web Soil Survey websoilsurvey.nrcs.usda.gov Look up any parcel's soils and farmland rating.

Idaho Department of Water Resources idwr.idaho.gov Water right search, transfers and forfeiture rules.

USDA NRCS nrcs.usda.gov Conservation Considerations for Solar Farms (2024).

NC State Extension craven.ces.ncsu.edu Can Solar Energy Production Be Converted to Farmland?

American Farmland Trust farmland.org Farmland loss data and its Smart Solar principles.

USDA Census of Agriculture nass.usda.gov County-by-county farm and acreage counts.

Revision history

Revision	Date	What changed
Rev. 1	Nov. 2026	First public edition. Data checked against the source research papers and original records.
Rev. 2	Nov. 9, 2026	Reviewed against Idaho's 2026 laws in force July 1 (H.B. 895 and H.B. 911) and the failed H.B. 897. Series expanded to six guides. Revision history added.
Rev. 3	Nov. 9, 2026	Layout check. A trial page watermark was removed. Earlier versions moved to the Old Revisions folder.
Rev. 4	Nov. 10, 2026	Rewritten in plain language with a clear position. Added USDA NRCS solar guidance (2024), NC State Extension findings on restoring solar sites, 2022 Census of Agriculture farmland losses for Idaho, sagebrush recovery research, the federal order on using already-disturbed sites, and the Saline Township, Michigan, farmland case.
Rev. 5	Nov. 10, 2026	Added a part on southern Idaho's soils: how they formed, why they're unusual and what that means for a data center site, from university and government sources. Added how Idaho's 2026 water law compares with other states. Removed a company name from the cover and footer.
Rev. 6	Nov. 11, 2026	Added H.B. 911 (Idaho Code § 61-335), Idaho's 2026 large-customer power law, to Part 03 beside the water law. Fact-checked against sources in November 2026.
Rev. 7	Nov. 16, 2026	Fact-check against primary sources and a ChatGPT cross-check. Confirmed the Census of Agriculture, Saline Township, pipeline and sagebrush figures against their sources. Series is now nine guides. Straight quotes throughout.

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Revision	Date	What changed
v8	Nov. 22, 2026	Cross-guide review. Water law wording now matches Idaho Code § 42-252 (consumptive use; city, water district or water and sewer district). Saline Township, sagebrush and farmland figures reconfirmed. Version and date stamp added to every page.

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PART 08

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Short citations appear as footnotes on each page. Full references follow.

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