

What-to-do manual: Solar Flare

the Americas · Updated on 2026-09-09 · comoactuaen crisis.com

Of all the scenarios on this site, this is the one that generates the most myths. NASA says it plainly: a solar storm does not cause you physical harm if you're on Earth. What it can affect are GPS, high-frequency radio, and, in the extreme case, the power grid. Here's the difference between what's real and what's fearmongering.

Before the crisis

First things first: it doesn't harm you physically

NASA states this explicitly: solar storms **do not cause direct harm to anyone on Earth**, because the planet's magnetic field and atmosphere protect us. The radiation from a solar flare **does not physically affect people on the ground**. The real radiation risk applies only to astronauts and flight crews on routes that cross polar regions, not to the rest of the population.

What NASA does document as a real possibility: geomagnetic storms induce electric currents in transmission grids, which can damage transformers, relays, and circuit breakers; strong flares can disrupt the high-frequency radio signals that travel through the upper atmosphere; and they heat and expand that atmosphere, increasing drag on low-orbit satellites, which then lose altitude.

- No special preparation is needed beyond what you'd do for any other scenario: family plan, emergency backpack, and a reserve of water and food.
- If you rely on GPS for work or driving, keep a physical map as a backup.
- Follow only official space-weather monitoring sources: NOAA's Space Weather Prediction Center publishes verified alerts.
- Be skeptical of any viral message announcing a "total blackout" on an exact date: space agencies warn with data, not social media rumors.

Source: NASA — Solar Storms and Flares. <https://science.nasa.gov/sun/solar-storms-and-flares/>

During the crisis

How to read NOAA's official scales. There are three independent scales, each measuring a different effect:

G Scale — geomagnetic storms (affects the power grid)

Runs from G1 to G5. At **G3** there are intermittent satellite navigation problems. At **G4** satellite navigation is degraded for hours. At **G5**, the most severe level, some power grid systems can experience complete collapse or blackouts.

R Scale — radio blackouts (affects communications)

Runs from R1 to R5. At **R5**, the most severe level, there is a complete high-frequency radio blackout across the entire sunlit side of Earth, lasting hours.

S Scale — solar radiation storms (affects satellites and aviation)

Runs from S1 to S5. At **S5**, satellites can be rendered inoperable, with possible permanent damage to their solar panels.

Even during the most recent G5 event, the U.S. power grid held

During the extreme storm of May 2024 — the first G5 event since 2003 — the U.S. electric reliability regulator NERC documented a peak geomagnetically induced current of **175.7 amperes** in Wisconsin, and confirmed that **the bulk power system remained stable** across the United States, with only isolated impacts: a 14-hour, 35-minute outage at one facility caused by a surge arrester. It's proof that modern infrastructure, when it has protocols for managing these storms, can withstand an extreme event without collapsing.

Source: NOAA Space Weather Prediction Center — NOAA Space Weather Scales Explanation. <https://www.spaceweather.gov/noaa-scales-explanation>
Source: NERC — North American Electric Reliability Corporation — Review of the May 2024 Geomagnetic Disturbance Event. <https://www.nerc.com/globalassets/programs/rapa/gmd/reference-documents/may-2024-gmd-event-review.pdf>

After the crisis

If your area experienced a power outage from a geomagnetic storm, the rules are the same as for any other blackout: check the power outage guide for food, generators, and dealing with cold or heat without electricity.

- Check that GPS and navigation systems are working normally before relying on them for a long trip.
- Report any electrical damage to your power provider, even if it seems minor.

Source: NOAA Space Weather Prediction Center — Impacts on Electric Power Transmission. <https://www.spaceweather.gov/impacts/electric-power-transmission>

Family plan

A family plan is not a pretty document: it is a handful of agreements made **today**, while everyone is calm, so you do not have to decide with your heart racing and no signal on your phone. It takes one conversation over the table and fits on a sheet of paper stuck to the refrigerator.

1. Decide where to meet, in two different places

One near home, for getting out quickly, and another outside the neighborhood, in case you cannot get back to the area. Everyone should know both by heart, children included, and it should not depend on anyone having a phone handy.

2. Name an out-of-area contact

One person in another city that everyone texts when they can. That person gathers information and passes it along, so no one has to go out looking for anyone else. It works because local lines get overloaded first, and because a text gets through where a call does not.

3. Assign responsibilities to specific people

Who grabs the emergency bag, who shuts off the gas and power, who helps the older person or someone with reduced mobility, who gets the pets out. A task with no owner is a task no one does.

4. Keep the list on paper

Phone numbers for family, the out-of-area contact, the doctor, the school, insurance, and emergency services. On paper, in the emergency bag, and in your wallet. A phone with a dead battery has no address book.

5. Practice it once

A fifteen-minute drill reveals what the conversation does not: that the emergency bag was buried in the closet, that no one knows where the gas shutoff is, that the child does not remember the meeting point. Repeat it at least once a year and whenever something important at home changes.

Talk to children without scaring them

Explaining what might happen and what you will do reduces fear instead of adding to it: panic comes from not knowing, not from knowing. Tell them the plan like a routine —"if this happens, we go there and meet mom"—, let them help pack the emergency bag, and tell them clearly that **if they are at school, the school takes care of them and no one comes running to get them**. And do not forget the pets: they are part of the plan too, with their food, water, and carrier.

Source: FCC and FEMA (U.S.) — Tips for Communicating During an Emergency.

https://www.fcc.gov/sites/default/files/fcc-fema_tips_for_communicating_during_an_emergency.pdf

Source: Ready.gov · FEMA (U.S.) — People with Disabilities. <https://www.ready.gov/es/discapacidad>

Source: Ready.gov · FEMA (U.S.) — Financial Preparedness. <https://www.ready.gov/financial-preparedness>

Food and water

The water number you need to memorize

The CDC sets it without ambiguity: **at least 1 gallon (3.8 liters) per person per day, for 3 days**. Ready.gov adds the nuances that save whoever heeds them: **"children, nursing mothers, and sick people may need more"**, and **"with very high temperatures, water needs can double"**. If someone in your home is pregnant, sick, or you live in a hot climate, that number is a floor, not a target.

How to store it so it works when you need it

The CDC calls for **approved food-grade containers** with a tight-fitting lid, made of a sturdy, unbreakable material —**never glass**— and with a narrow mouth for pouring. An explicit warning: **never use a container that has held toxic chemicals** such as bleach or pesticides. And what almost everyone forgets: **stored water should be replaced every 6 months**. To disinfect the container before filling it, use a teaspoon of unscented household bleach per liter of water, wait 30 seconds, and pour it out.

What food to keep on hand

Ready.gov recommends **several days of non-perishable food** and gives a concrete list: ready-to-eat canned meats, fruits, and vegetables —**and a can opener**—, protein or fruit bars, dry cereal or granola, peanut butter, dried fruit, canned juices, and pasteurized long-life milk. The rule when putting it together is simple: food your family will actually eat, that needs no cooking, and that you can rotate before it expires.

No power, the food clock is running: 4 hours and 48 hours

The official figures come from FoodSafety.gov, part of the USDA: **a refrigerator keeps food safe for up to 4 hours** if you do not open it, and **a full freezer holds for about 48 hours (24 if half full)**. The discard threshold: any perishable food —meat, poultry, fish, eggs, leftovers— that has been **at 4 °C (40 °F) or above for 2 hours or more must be thrown out**. A full freezer holds twice as long as a half-full one, so filling the empty space with bottles of water before a forecast storm is money saved. And the line every agency closes with: **"when in doubt, throw it out"**. Do not taste it to find out.

- Keep the refrigerator and freezer **closed**: every time you open one, you waste hours of stored cold.
- **Throw out any food that has touched floodwater**, even if the container looks intact. This is an explicit Ready.gov instruction.
- Keep a manual can opener. It is the item people forget most, and without it your pantry is useless.
- If you buy bottled water, keep it **sealed in its original container**, in a cool, dark place.

Source: CDC — Centers for Disease Control and Prevention (U.S.) — How to Create and Store an Emergency Water Supply.

<https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html>

Source: Ready.gov · FEMA (U.S.) — Water. <https://www.ready.gov/water>

Source: FoodSafety.gov · USDA and HHS (U.S.) — Food Safety During a Power Outage.

<https://www.foodsafety.gov/food-safety-charts/food-safety-during-power-outage>

Source: Ready.gov · FEMA (U.S.) — Food. <https://www.ready.gov/food>

Power and communications

The generator rule: 6 meters, no negotiating

The CPSC does not soften it: **"using a generator indoors CAN KILL YOU IN MINUTES"**, because **"generator exhaust contains carbon monoxide, a poison you cannot see or smell"**. The official distance, repeated by the CDC and CPSC: **only outdoors, more than 20 feet (6.1 meters) from any window, door, or vent**. The same goes for pressure washers, charcoal grills, and camp stoves. A battery-powered carbon monoxide detector is cheap and the only thing that warns you in time.

When the cell network is overloaded: text, do not call

The joint FCC and FEMA guide explains why: **"text messages may get through when your call does not"**, even if delivery is delayed when the network is congested. And it asks for something almost no one does: **"limit non-emergency calls"**, because every call takes up space that emergency communications need. Also save a contact under the name **"ICE"** (In Case of Emergency), the convention rescue personnel look for on someone else's phone.

How to stretch your battery

The same guide recommends **lowering screen brightness and turning off apps** to conserve charge. In an emergency your phone stops being entertainment and becomes your only line to the outside world: treat it like your water supply.

The battery-powered radio is still irreplaceable

The FCC and FEMA recommend **a battery-powered radio or a portable television** to follow emergency bulletins during power outages. It is the only channel that depends on neither your electricity nor the cell network.

The alerts you already have and did not know about

In the United States, **Wireless Emergency Alerts** are free messages that go straight to your phone for severe weather, AMBER alerts, and threats to safety in your area. Two things worth knowing: **you do not need to sign up—phones have supported them since 2012— and they are not affected by network congestion**, so they get through when calls no longer do. Find out what the equivalent system is in your country, and do not mute it.

- Have at least one light source that does not depend on the grid: a battery-powered or hand-crank flashlight, or a rechargeable lamp.
- Charge phones and backup batteries **before** the forecast event arrives, not after the power is already out.
- Keep a list of important phone numbers **on paper**: if your phone dies, your contacts die with it.
- Agree with your family that after an emergency **everyone texts the same contact** instead of calling each other.

Source: CPSC — Consumer Product Safety Commission (U.S.) — What to Know About Portable Generators and Carbon Monoxide.

https://www.cpsc.gov/s3fs-public/468-WhattoKnowGenerators_2022.pdf

Source: FCC and FEMA (U.S.) — Tips for Communicating During an Emergency.

https://www.fcc.gov/sites/default/files/fcc-fema_tips_for_communicating_during_an_emergency.pdf

Source: FEMA (U.S.) — Wireless Emergency Alerts (fact sheet). <https://www.ready.gov/sites/default/files/2020-08/wea-fact-sheet.pdf>

Health and special needs

This is the section that decides who has a hard time and who has a dangerously hard time. An emergency does not suspend diabetes, high blood pressure, pregnancy, or dependence on an oxygen concentrator: **what gets cut off is access to the pharmacy, the clinic, and electricity**. Everything that follows needs to be prepared beforehand, because

once the emergency hits, there is no more room.

1. Keep a reserve of your medications, and know which ones hold up

Ready.gov calls for **a several-day supply of prescription medications**. For those that need refrigeration, the CDC is blunt: **once the power has been out for a day or more, discard any medication that requires refrigeration**, unless its label says otherwise.

2. The insulin exception, worth knowing word for word

The FDA documents that insulin in the manufacturer's original vials or cartridges —opened or unopened— **can stay unrefrigerated between 15 and 30 °C (59 and 86 °F) for up to 28 days and still work**. It loses effectiveness at extreme temperatures, and the longer the exposure, the less effective it becomes. In an emergency **"you may still need to use insulin that was stored above 30 °C"** —that is better than not using it at all— but as soon as proper storage is available again, those vials **should be discarded and replaced**.

3. If someone depends on electric medical equipment, there is one step almost no one takes

Ready.gov says it explicitly: you can **ask your power company to put you on a priority list for service restoration**. That step is free, can be done on any ordinary day, and changes the order in which you get reconnected. Add a backup battery for an electric wheelchair and for any assistive device, and talk with your doctor about how to keep the equipment running during a power outage.

4. Keep a copy of medical information, not just the pills

A list of medications with dosages, allergies, diagnoses, doctors' contact information, and —for infants— the vaccination record. A prescription bottle cannot always be refilled at a pharmacy in another city; a written list can solve that.

Pregnancy and newborns

The CDC calls for **prenatal vitamins and other medications** in the kit, plus supplies in case delivery happens without being able to reach a hospital: clean towels, clean sharp scissors, a bulb syringe, gloves, two clean white shoelaces to tie the cord, clean sheets, sanitary pads, soap or alcohol, and garbage bags. For infants: diapers, wipes, ointment, bottles, and formula. One detail that matters: **ready-to-feed formula is the safest option in an emergency**, because it does not need to be mixed with water and comes in sterile, single-use containers.

Disability, reduced mobility, and older adults

Ready.gov stresses **planning accessible transportation in advance** for evacuating or getting around, and including a service or support animal with its food, water, and supplies. That plan should be worked out with specific, named neighbors, not left vague.

The blow that comes later: mental health

The CDC names the normal reactions after a disaster —**fear, anger, sadness, worry, numbness, frustration, trouble sleeping, or nightmares**— and recommends taking care of your body, staying in touch with other people, and taking breaks from the news. In the United States and its territories, the **Disaster Distress Helpline is available 24 hours a day: 1-800-985-5990**, with service in Spanish. Asking for help here is not weakness: it is part of recovery, just like repairing the roof.

Source: Ready.gov · FEMA (U.S.) — People with Disabilities. <https://www.ready.gov/es/discapacidad>
Source: CDC — Centers for Disease Control and Prevention (U.S.) — What to Do to Protect Yourself During a Power Outage. <https://www.cdc.gov/natural-disasters/response/what-to-do-protect-yourself-during-a-power-outage.html>
Source: FDA — U.S. Food and Drug Administration — Information Regarding Insulin Storage and Switching Between Products in an Emergency. <https://www.fda.gov/drugs/emergency-preparedness-drugs/information-regarding-insulin-storage-and-switching-between-products-emergency>
Source: CDC — Centers for Disease Control and Prevention (U.S.) — Emergency Kit Checklist: Pregnant Women, Infants, and Children. <https://www.cdc.gov/children-and-school-preparedness/resources/emergency-kit-checklist-pregnant-women-infants-and-children.html>
Source: CDC — Centers for Disease Control and Prevention (U.S.) — Coping With Disaster or Traumatic Event. https://www.cdc.gov/natural-disasters/media/pdfs/2024/08/coping_with_disaster_2_english.pdf

Home and belongings

Photograph before you throw anything away. It is the rule that recovers the most money

The official insurance instruction is literal: **"photograph and video the interior and exterior of your property, taken before you throw anything away"**. After that, you need to **report the loss to your insurer right away**, and **keep receipts, statements, and contractor invoices**, which is what ensures your claim payment arrives on time. Cleaning up before documenting is, in practice, giving up your claim.

1. Before you go back in: look, smell, and listen from outside

The CDC lays it out this way: **if you smell gas or suspect a leak, shut off the main valve, open all the windows, and get out immediately**. If there is standing water inside and you can cut the power from a dry spot, do it. And one simple warning that prevents explosions and fires: **use battery-powered flashlights, not candles, gas lanterns, or torches**.

2. Ventilate before you settle in

The CDC recommends going in briefly to open doors and windows, and **letting the house air out for at least 30 minutes** before staying inside.

3. Shutting off utilities: when to do it, and the mistake you cannot make

Gas has a rule with no exceptions: if you shut it off for any reason, **only a qualified professional can turn it back on. Never turn it back on yourself**. **Electricity** is shut off by switching off the individual circuits first and the main breaker last—the order matters, because an electrical spark can ignite gas if there is a leak—. **Water** should be shut off if pipes may have cracked, because that contaminates the house supply, and should not be turned back on until authorities confirm it is safe to drink.

4. Go back only when authorities say it is safe

It sounds obvious, and it is the instruction people break most often: **go back home only when authorities say it is safe**. Structural damage is not always visible from the street.

- Make a photo inventory of what is in each room today: it takes twenty minutes and is worth its weight in gold for a claim.
- Keep that inventory and your policies **outside the house**—in the cloud or with a family member— because a file that gets soaked along with the house is useless.
- If you have to leave, take your documents with you, not your furniture.
- Do not sign anything with a contractor while you are in shock: check the money section for the warning signs of fraud.

Source: FEMA · NFIP (U.S.) — Starting Your Recovery (National Flood Insurance Program fact sheet).

https://agents.floodsmart.gov/sites/default/files/media/document/2025-07/fema-nfip-starting-your-recovery_fact-sheet-10-2021.pdf

Source: CDC — Centers for Disease Control and Prevention (U.S.) — Safety Guide for Reentering a Flooded Home.

<https://cdc.gov/floods/safety/reentering-your-flooded-home-safety.html>

Source: Hawaii Department of Human Services (U.S.) — Utility Shutoff and Safety (official emergency preparedness guide).

<https://humanservices.hawaii.gov/communications/are-you-ready/utility/>

Money and income

Cash in small bills: the detail people discover too late

Ready.gov recommends it for a concrete reason: **"it is important to keep small bills on hand because ATMs and credit cards may not work during a disaster"**, right when you need to buy supplies, fuel, or food. No power means no card reader, and without a card reader a large bill is useless if no one has change.

The documents you need to protect today

The official recommendation is to keep insurance policies, deeds, property records, and other important papers **in a safe place outside the house**. FEMA publishes the **Emergency Financial First Aid Kit** for this, organized into four sections: household identification, financial and legal documentation, medical information, and contacts. Its rule for paper: **a fireproof and waterproof box or safe**, a bank safe-deposit box, or in the hands of someone you trust. For digital files: **password-protected files** on an external drive or in secure storage outside the home. And if you pay everything online, print your account records periodically.

An emergency fund, even a small one

The CFPB avoids magic formulas: **"the amount you need depends on your situation"**, but **"even a small amount can provide some financial security"**. Its underlying argument is the one that matters: without that cushion, a single unexpected expense **can grow far larger than the original bill through interest and fees**, because it forces you to rely on credit.

After the disaster come the people who rob you with paperwork

The CFPB describes the exact pattern: **"be wary of contractors who go door to door and of people who offer unsolicited 'opportunities' or use high-pressure tactics to force you to decide on the spot"**. Its concrete rules: **never pay by wire transfer, gift card, cryptocurrency, or cash**, because that makes it harder to get your money back; **do not make the final payment until the work is finished to your satisfaction**; and always ask **"can you show me your ID and your contractor's license?"** and **"can you give me three recent references from this area?"**. One fact that cuts off many scams at the root: **no FEMA worker or federal or state official ever asks for or accepts money**. Scammers pose as government employees, insurance adjusters, police officers, or bank employees.

Source: Ready.gov · FEMA (U.S.) — Financial Preparedness. <https://www.ready.gov/financial-preparedness>

Source: FEMA · Operation Hope (U.S.) — Emergency Financial First Aid Kit (EFFAK).

https://www.fema.gov/sites/default/files/documents/fema_effak-toolkit.pdf

Source: CFPB — Consumer Financial Protection Bureau (U.S.) — How to Avoid Scams and Fraud After a Disaster.

<https://www.consumerfinance.gov/ask-cfpb/how-do-i-avoid-scams-and-fraud-after-a-disaster-en-1529/>

What you can sell

Here it's worth starting with what you should **not** sell, because this is the scenario that generates the most quackery on this entire site. NASA is explicit that a solar storm does not cause direct physical harm to people on Earth. Anything sold with a promise of "personal protection" against a flare is a fraud.

Products sold on fear that do nothing

Bracelets, pendants, personal "shields," paints, or fabrics that claim to protect your body from solar radiation: there is nothing to protect against, because Earth's magnetic field and atmosphere already do that job. There's also no home device that "shields" an entire house from a geomagnetic storm. Selling that is profiting from an unfounded fear.

What does have legitimate demand is the same thing that helps during any extended outage, because the real, documented effect of a severe storm is on infrastructure, not on people:

- **Battery-powered or hand-crank radios** and paper maps, for people who depend on GPS and the internet.
- **Battery backup power** and surge protectors for sensitive equipment.
- **Data backups** and advice for small businesses that keep their information only in the cloud.
- **General preparedness**: water, food, lighting — the same as for any blackout.

Raising prices because people are desperate can be illegal

When a state of emergency is declared, many countries limit by law how much the price of basic goods can rise. In **California**, the limit is **10% above the pre-emergency price** for 30 days —and **180 days for repair and cleanup services**—, with penalties of up to one year in jail and a \$10,000 fine. **Texas** does not set a fixed percentage but penalizes "exorbitant" pricing with fines of up to \$20,000 per violation. In **Mexico**, the Ley Federal de Protección al Consumidor (Federal Consumer Protection Law) requires sellers to honor the price offered and any maximum prices set by authorities, and PROFECO can impose fines. In **Brazil**, the Código de Defesa do Consumidor (Consumer Defense Code) prohibits "raising a price without just cause." Charging a fair price for hard work is legitimate; taking advantage of desperation is not.

Source: ILO — International Labour Organization — Labour Overview of Latin America and the Caribbean 2025 (executive summary). https://www.ilo.org/sites/default/files/2025-12/Executive%20Summary_Labour%20Overview%202025_LAC_ILO.pdf

Source: PROFECO — Federal Consumer Protection Agency (Mexico) — Ley Federal de Protección al Consumidor (Federal Consumer Protection Law), articles 7, 8, and 128. https://www.profeco.gob.mx/juridico/pdf/Ley_fed_protec_consum.pdf

Source: California Attorney General (USA) — Price gouging during declared emergencies. <https://oag.ca.gov/consumers/pricegougingduringdisasters>

Source: Presidency of the Republic (Brazil) — Código de Defesa do Consumidor (Consumer Defense Code), art. 39, X (raising prices without just cause). https://www.planalto.gov.br/ccivil_03/leis/l8078compilado.htm

Businesses and self-employment

It helps to start with one figure to size up what we're talking about: according to the ILO, informality **affects nearly half of the employed population of Latin America and the Caribbean, around 47%**, with huge differences between countries — under 30% in Uruguay and Chile, over 70% in Bolivia and Peru. For millions of families in the region, "looking for a job" and "starting something on your own" are the same sentence. What follows is not a promise of income: it is a map of what people actually do when a crisis hits, with the requirements and the risks laid out plainly.

Operational continuity for small businesses

Most small businesses don't have a copy of their data outside the cloud, and don't know how they'd take payment if their card terminal and internet went down. A service that puts that in order — a local backup, a written alternative payment plan, backup power for the essentials — is useful in a geomagnetic storm and in the far more likely things that actually happen every month.

Communication without the network

Selling and setting up battery-powered or hand-crank radios, and teaching people to tune in to their area's official stations. Minimal investment. It's worth selling for what it actually is — independence from the power grid and cell network in any emergency — not for the most dramatic scenario.

United States — SBA disaster loans

For areas with a declared disaster. The **Economic Injury Disaster Loan (EIDL)** provides working capital for affected small businesses and nonprofit organizations; the **physical damage loan** covers losses not covered by insurance. Combined cap of **\$2 million**, interest **not exceeding 4%** if you cannot obtain credit elsewhere, terms of up to 30 years, and the first payment deferred 12 months. There is also a line for homeowners (up to \$500,000) and for renters for personal property (up to \$100,000).

Mexico — what actually exists today

FONDEN stopped taking on new commitments on January 1, 2021. What operates today in emergencies is **PAEAN**, run by Civil Protection, and it is worth knowing exactly what it is and is not: it delivers **relief supplies** — food kits, water, blankets, roofing sheets, cleaning materials — when a state's own capacity is overwhelmed. **It is not a reconstruction fund or a loan for your business.** For capital, look at state, municipal, or development-bank programs, always verifying on the official website: fraud schemes that use its name circulate around these programs.

Brazil — Pronampe for micro and small businesses

A credit line for **microenterprises** (annual revenue up to 360,000 reais) and **small businesses** (from 360,000 to 4.8 million). The amount can reach up to **60% of the previous year's gross revenue** for businesses with more than one year in operation, and up to 50% for new ones. The maximum rate is the SELIC rate plus up to 6% per year.

Source: SBA — Small Business Administration (USA) — Economic Injury Disaster Loans.

<https://www.sba.gov/funding-programs/disaster-assistance/economic-injury-disaster-loans>

Source: SSPC — National Civil Protection Coordination (Mexico) — Guidelines for the Program for Emergency Response to Natural Hazards (PAEAN).

<https://sidof.segob.gob.mx/notas/docFuente/5626632>

Source: Federal Government (Brazil) — Novo Pronampe — credit for micro and small businesses.

<https://www.gov.br/memp/pt-br/programa-acredita/novo-desenrola-brasil/novo-pronampe>

Related articles

Three storms that mark the scale of the risk, from oldest to most recent.

Carrington Event, September 1–2, 1859 — the largest storm ever documented

It caused auroras visible as far south as Panama; there are accounts of people reading the newspaper by that night light. Telegraph systems around the world received shocks and stopped working. There's no figure for people affected, because in 1859 there was no power grid that could collapse. **NOAA's official takeaway:** an event of this magnitude occurs roughly **every 500 years**, a figure agencies use today to calculate the real risk to modern electrical infrastructure.

Quebec Geomagnetic Blackout, March 13, 1989

At 2:44 a.m., the Hydro-Québec power grid collapsed **in under a minute**. The province went completely dark for **more than nine hours**. **The official lesson:** Hydro-Québec recalibrated its protection systems, created real-time space weather alerts, and added series compensation to its transmission lines to withstand future storms — changes that are part of why the system held up better in 2024.

One more myth to debunk

No solar flare can "shut down the internet forever" or instantly "fry" people's phones, as claims circulating online suggest. The documented effects are on specific infrastructure — satellites, high-frequency radio, electrical transformers — and their magnitude depends on the storm's actual intensity, as measured by the official scales, not by a headline.

Related guides on this site:

- Power Outage — what to do if the power really does go out.
- Energy Crisis — the fragility of the grid in general.
- Meteorite Impact — the site's other astronomical scenario.

Source: NOAA NESDIS — What Was the Carrington Event?.

<https://www.nesdis.noaa.gov/about/k-12-education/space-weather/what-was-the-carrington-event>

Source: Hydro-Québec — The March 1989 Storm. <https://www.hydroquebec.com/learning/notions-de-base/tempe-te-mars-1989.html>

Source: NERC — North American Electric Reliability Corporation — Review of the May 2024 Geomagnetic Disturbance Event.

<https://www.nerc.com/globalassets/programs/rapa/gmd/reference-documents/may-2024-gmd-event-review.pdf>

Frequently asked questions

Can a solar flare cause me physical harm here on Earth?

No. NASA states this explicitly: solar storms do not cause direct harm to anyone on Earth, because the planet's magnetic field and atmosphere protect us. The radiation from a solar flare does not physically affect people on the ground. The real radiation risk applies only to astronauts and flight crews on routes that cross polar regions.

What does a G5 geomagnetic storm mean?

It's the most severe level on NOAA's G scale, and it means some power grid systems can experience complete collapse or blackouts. However, during the G5 storm of May 2024, the electric reliability regulator NERC confirmed that the United States' bulk power system remained stable, with only isolated impacts.

What should a family emergency plan include?

Two meeting points—one near home and one outside the neighborhood—, an out-of-area contact everyone texts to gather information, assigned tasks with names attached (who grabs the emergency bag, who shuts off gas and power, who helps people who need support, who gets the pets out), and a list of important phone numbers on paper. It is worth practicing at least once a year.

How much water should you store per person for an emergency?

The CDC recommends at least 1 gallon (3.8 liters) per person per day for 3 days. Ready.gov warns that children, nursing mothers, and sick people may need more, and that with very high temperatures water needs can double. Stored water should be replaced every 6 months.

How long does food last in the refrigerator during a power outage?

According to FoodSafety.gov, part of the USDA, a refrigerator keeps food safe for up to 4 hours if it stays closed, and a full freezer for about 48 hours (24 hours if half full). Any perishable food that has been at 4 °C or above for 2 hours or more should be discarded. The official rule is: when in doubt, throw it out.

How far from the house should a portable generator be placed?

Only outdoors, more than 20 feet (6.1 meters) from any window, door, or vent, according to the CDC and CPSC. The CPSC warns that using a generator indoors can kill in minutes, because its exhaust contains carbon monoxide, a poison you cannot see or smell. The same rule applies to pressure washers, charcoal grills, and camp stoves.

Is it better to call or text during an emergency?

Text. The joint FCC and FEMA guide explains that text messages may get through when a call does not, even if there is a delay when the network is congested, and it asks people to limit non-emergency calls so they do not tie up the network that emergency services need.

Does insulin go bad if the power goes out?

Not right away. The FDA documents that insulin in the manufacturer's original vials or cartridges, opened or unopened, can stay unrefrigerated between 15 and 30 °C for up to 28 days and still work, though it loses effectiveness at extreme temperatures. In an emergency it is better to use it than to go without, but as soon as proper storage is available again, those vials should be discarded and replaced.

What should you do if someone at home depends on medical equipment that needs electricity?

Ready.gov recommends asking the power company to put your address on a priority list for service restoration, keeping a backup battery for electric wheelchairs and assistive devices, and talking with your doctor about how to keep the equipment running during a power outage. This is something to arrange beforehand, not during the emergency.

Can you start cleaning your house after a disaster?

Before you throw anything away or clean anything, you need to photograph and video the interior and exterior of the property and report the loss to your insurer right away, according to the official guide from FEMA's National Flood Insurance Program. You should also keep receipts, statements, and contractor invoices. Cleaning before documenting usually means losing the claim.

Can you turn the gas back on yourself?

No. The official emergency preparedness guide is explicit: if you shut off the gas for any reason, only a qualified professional can turn it back on. Also, when shutting off electricity, switch off the individual circuits first and the main breaker last, because an electrical spark can ignite gas if there is a leak.

Why should you keep cash on hand for an emergency?

Because ATMs and card readers depend on electricity and network access, and they tend to stop working right when you need to buy water, fuel, or food. Ready.gov recommends keeping a small amount of cash at home, in a safe place and in small bills, since change may not be available during an emergency.

How can you tell if a contractor offering to repair your house is a scam?

The CFPB flags as red flags going door to door, offering unsolicited opportunities, or pressuring you to decide on the spot. It recommends never paying by wire transfer, gift card, cryptocurrency, or cash, not making the final payment until the work is finished to your satisfaction, and asking for ID, a contractor's license, and three recent references from the area. Also, no FEMA worker or federal or state official ever asks for or accepts money.

How often does a solar storm like the one in 1859 occur?

According to NOAA, an event of the magnitude of the 1859 Carrington Event occurs roughly every 500 years. That figure is what space agencies use today to calculate the real risk to modern electrical infrastructure, which is very different from what existed in the 19th century.