



MDRS 2013-2014 Field Season

Personal Equipment List

These lists are suggested equipment for each Mars Desert Research Station (MDRS) crewmember. They do not cover all the details of what you should consider bringing for your tour of duty.

Environment

The MDRS is located in the high desert plateau country near Hanksville, Utah. The weather can range from pleasant to very hot or cold, depending on the season. In the early spring and spring, temperatures may drop to below freezing (20°F or approx. -5°C, especially early in the morning) and rise to very pleasant levels (60°F or approx. +15°C on some afternoons). The air is usually very dry, but it may snow, sleet or rain. Winds can peak to 50 kts and windchill is an important factor to consider. The area can be muddy in places during the rainy season (October through March). Late spring and summer are usually quite hot and dry (100°F or approx. 37°C), and afternoon thunderstorms are common in the highlands. Flash floods are a potential hazard. If you plan to do field work, be sure to familiarize yourself with basic desert safety.

A few bits of MDRS jargon:

- ATV = "All-Terrain Vehicle", i.e., 4-wheeled motorbikes or "quads" used for transport on the desert roads
- EVA = Extra-Vehicular Activity (field work in simulation)

Internet Connection

If possible, bring your personal laptop. Beware, the environment is dusty and hardware will suffer (MDRS is not an airtight structure). Power to recharge laptops will be available to all, but we don't recommend desktop computers (without batteries) because of occasional blackouts caused by generator malfunctions.

Internet service at the Hab uses a satellite connection through Hughesnet and thus is extremely limited in bandwidth. Between the hours of 7 am and 2 am Mountain time, the habitat as a whole is limited to about 350 Mb total transmission each way. If this allotment is exceeded, the internet connection automatically downgrades to extremely slow for a period of 24 hours. For this reason it is imperative to control automatic downloads to your computer and personal devices. Before you come to MDRS, make sure all your applications are updated (e.g. operating system updates, virus/malware protection, application updates such as MS Office etc. Then turn off all automatic updating and put a reminder on your calendar to turn them back on after your mission is over. Don't forget to cancel updates on your smartphone – if it plugs into your computer it may try to download its own software and app updates.

Batteries

All crewmembers should bring the batteries (rechargeable or not) they will need. NOTE please remove dead or near-dead batteries from the MDRS after use. Be sure to dispose of the batteries in an environmentally sound way and in accordance with all applicable laws. NOTE: NOTHING you bring can stay at the HAB!! Unless with item by item very explicit permission of the Director!

Toilet

There is a normal flush toilet at the MDRS. The toilet formerly used recycled water from the GreenHab, but it is now plumbed with potable water. The toilet waste line ends in the septic tank. The line to the septic tank is not as wide as in normal homes, and has been known to clog. Please put NOTHING into the toilet except human waste and the minimum amount of toilet paper that you need to clean up after using the toilet. NO wet wipes in the toilet, no Q-tips and certainly NO TAMPONS and NO SANITARY NAPKINS In the toilet. These last items should be wrapped in toilet paper or some other covering, and placed in the bathroom wastebasket. If you are in the habit of discarding your feminine hygiene products in the toilet, practice an alternative way of removing them before you get to MDRS so that you don't drop them into the toilet by mistake.

What to Pack

In the list of items below:

"Required" designates equipment/gear that each field team member MUST bring along. In some cases, a spare is required. "Required" equipment is considered bare-bones minimum. You should definitely have this equipment in order to be properly prepared for your rotation at the MDRS.

"Recommended" designates equipment/gear that each field team member is strongly advised to bring along. These are items that are not required but are likely to make your life A LOT more pleasant.

"Optional" designates additional suggested equipment/gear. This is equipment that you should bring along if you think you will enjoy having it.

Personal Clothing and Gear

What to Bring	How Much	Need	Notes
Clothing	For 15 days with re-wearing	Required	Bring at least one change of warm clothing (heavy sweater, fleece, long pants, long/thermal underwear, plus winter hat and gloves in winter) as the Utah high-desert can be cold at night. Most people wear long pants and a long-sleeve t-shirt in the EVA suits to keep the suits from chafing your skin, although long/thermal underwear is recommended.
Underclothes	8-15	Optional	There are no laundry facilities at MDRS; but space is also limited so consider wearing undergarments for more than 1 day.
Socks	8-15 pairs	Required	Bring 15 if you want to wear a clean pair of socks daily. It gets dirty out here quickly. Bring at least one or two pairs of tall socks. Wool or specialized hiking socks are recommended.
Bath towels, washcloth	2+	Required	You'll get a 2 minute Navy shower every 2-3 days. Practice at home especially for hair washing. A washcloth is helpful for low-water-use bathing. Consider a shower cap if your hair is long.
Baseball cap or brimmed hat	1	Optional	Great for keeping your head out of the sun when outside & not in sim. Not for wearing during EVA, though. The snoopy caps supplied at MDRS are in reality water polo caps. They keep your hair from getting in your eyes, and help keep your radio mic in position.
Hiking Boots	1 pair	Required	There are no longer any supplied boots at MDRS. You need to wear your personal boots on EVA. If you do, be aware that they will get extremely muddy and/or dusty.
Windbreaker or winter jacket	1	Recommended	Bring a light jacket for night-time activity in the high desert in the warm season. If your mission occurs during the cold season, a winter jacket is essential.
Slippers or indoor sandals	1 pair	Required	Outdoor footwear is not worn in the living space (upper deck of Hab), but going barefoot is not recommended due to splinters & rodents.
Bathrobe/Pajamas	1 +	Recommended	It's a long way to the bathroom: through a cold, dark lab at night, and through a throng of fellow crewmembers in the morning.

Personal Items

What to Bring	How Much	Need	Notes
Duffel Bag or big suitcase	1	Required	There is limited storage space in the Hab for personal gear. All of your personal belongings must be stored in your stateroom. These average 4' wide and 11' long.
Laundry bag	1	Optional	No washer or dryer is available so washing is not really possible.
Ziploc bags and facial tissue	1-2 boxes	Recommended	These are great for collecting and protecting samples as well as protecting personal gear (i.e. cameras) free from dust in the field. Consider easy lock zipper bags as gloves impair manual dexterity on EVA.
Sleeping bag	1	Required	A winter bag is recommended. Stateroom bunks contain no bedding. Spring temperatures in the desert can drop below 0° C at night, and you must be prepared for potential loss of power in the Hab.
Thermarest pad/sleeping pad	1	Required	No padding is provided in your stateroom bunk. Full body length padding is recommended for warmth and comfort. There are some pads at the Hab, but we do not promise you will have access to one.
Pillow	1	Recommended	No pillows are provided; bring one if you need it for a good night's sleep. Alternatively, stuff a pillowcase with clothing/ jacket and sleep on that.
Flashlight or head-lamp	1	Recommended	Useful at night, for repairing stuff, on EVAs... Bring spare batteries too.
Personal water bottle	1	Required	Helps you remember to stay hydrated in the dry desert climate
Personal mug or cup	1	Recommended	Makes it easy to identify your drink and reduces dishwashing
Hydrating cream, body lotion, lip care (e.g. chapstick, blistex)		Recommended	The high desert is an extremely dry environment. You will be more comfortable and thus more productive if your face and hands are protected by a lotion, and your lips by a lip balm.
Hydrating eye/nose drops	1	Recommended	The high desert is both dry and dusty. Required if you are prone to nosebleeds or eye irritation, or wear contact lenses
Sunscreen	1	Required	Desert sun can be intense; the higher altitude also increases its intensity. EVA suit helmets provide only partial protection.
Sunglasses	1 or 2	Recom-	For UV protection. If you intend to wear them on

		mended	EVA, bring something to secure them behind your head so they don't slip down your nose.
Personal first-aid kit		Optional	For small cuts, abrasions etc. MDRS has a well stocked first aid kit and a doctor on call at all times.
Ear Plugs	as needed	Optional	If you are bothered by noises when trying to sleep
Watch	1	Required	Necessary for EVA operations.
Personal bath product		Recommended	Please bring your own soap, shampoo, conditioner and other products that you use in your daily life. There are personal cubbies in the shower room to store these items.

Personal Field Gear

What to Bring	How Much	Need	Notes
Utility knife (like a Swiss Army knife or Leatherman combo tool)	1	Strongly recommended	Very handy for repairs and field work. Note the airline restrictions on these items – bring yours in checked baggage.
Rock Hammer	1	Optional	Recommended for geologists. Rocks in the area are mostly "soft" so a standard sedimentary pick/hammer ("mason's tool") should suffice; the Hab has one sledge hammer. Ship in checked baggage.
Hand Lens/Loupe	1	Recommended	10X-14X for close examination of specimens in the lab.
Brunton	1	Optional	For the level and clinometer device. Many smartphones have an app for these measurements.
Personal (handheld) GPS & charger or batteries	1	Recommended	If you have one, bring it; if you don't, use the ones at MDRS. Note that MDRS data are recorded in UTM Zone 12 North Northings/Eastings. Know how to use the GPS and to set it to the correct measurement system. Bring spare batteries.
Field Book, Pens	1	Recommended	Waterproof recommended.
Topographic Maps	As needed	Recommended	MDRS has one or two copies of the local (Skyline Rim Quad) topo maps at 1:24,000. Detailed mapping may require additional maps at better scales; check on-line with the USGS for information. http://www.usgs.gov/pubprod/ The maps in the hab are getting beat-up and old.
Camera/digital camera with	1	Recommended	If you have it, bring it. Digital images can be downloaded to the MDRS computer. Bring the

charger and/or extra batteries			appropriate cables and thumb-drives or memory cards, spare batteries or rechargeable batteries with charger, a sturdy case and a lens care kit (recommended). It is very difficult to take pictures with a non-digital camera through the helmet of the space suits.
“Canned Air”		Optional	Useful for cleaning cameras and other personal equipment in the field and in the Hab. Buy it in Grand Junction as aerosol cans are not welcomed aboard commercial flights.
Camcorder (tape or digital) plus charger and batteries	1	One required per crew	Great for outreach, YouTube videos, etc. Videorecorders allowing digital stills are very useful. Be sure to bring enough storage media, batteries, cables, and of course the charger.
Tripod	1	Optional	Extremely useful for field photos – the desert is windy and spacesuit gloves are awkward.
Photo scale or ruler	1	Optional	Recommended for taking field photos.
Bungee cords	1-2	Optional	Useful for securing items on ATVs & backpacks
Bubble wrap/Foam padding	as needed	Optional	If you need to transport delicate equipment on ATVs, be sure to bring adequate padding for the ATV cargo rack. Unpadded equipment and gear can take a severe beating when jolting over the uneven desert surface.
Personal laptop	1	Recommended	Bring all necessary peripherals: mouse, AC power adapter, etc.

Other Personal Gear

What to Bring	How Much	Need	Notes
Reading materials	As needed	Optional	Books, magazines, textbooks related to your field of work. Internet bandwidth is small so you can't just download everything you might need.
Movies	As needed	Optional	Note: MDRS doesn't have a DVD player – DVD's are usually watched from a crewmember's laptop.
Other fun stuff	As needed	Optional	Crew members should consider bringing something they might like to do – cards, board games, a toy, a small musical instrument, an art or craft project. However, there is no guarantee of spare time.
Food & candy	As needed	Optional	This season each crew is supplied with a set list of food. If a crew wants something other than what is on the list, they will need to bring it themselves.
Perfume or Cologne	None	Not permitted	Some individuals are sensitive to fragrance products. Be kind and don't use them at MDRS.
Alcoholic	None	Not	Not permitted in NASA facilities or at MDRS.

beverages		permitted	
Vitamins, food supplements	As needed	Optional	Permitted, but be sure you disclose them to the food study group.
Firearms and weapons	None	Not permitted	Not permitted in NASA facilities or at MDRS.