

WYOMING

NASA Space Grant Consortium

HIGH-ALTITUDE BALLOON NEWSLETTER

ISSUE 3 • SPRING 2025

Welcome to the Spring 2025 issue of our somewhat annual High-Altitude Balloon Newsletter! The 2024–2025 school year was full of excitement and wonder, and a few unexpected surprises. As before, this issue will include program updates and a few announcements about upcoming ballooning opportunities, as well as highlights from all of the balloon flights we conducted throughout the past year.

If you have any questions about our program or would like to reach us, please use the contact information provided at the end of the newsletter. Thanks again for reading and we hope you find this to be helpful and informative!

– Wyoming Space Grant Staff

BALLOONING BY THE NUMBERS

(As of May 2025)

Total balloon flights: 86

Launch observers: ~5,700

Direct participants: ~2,200

K-12 student participants: ~1,800

Average burst altitude: 93,218 ft

Highest burst altitude: 107,373 ft

Average flight distance: 51.8 miles

Longest flight distance: 122.2 miles

UPDATES & ANNOUNCEMENTS

Flight Opportunities for 2025–2026

If you're interested in learning more about high-altitude ballooning opportunities during the 2025–2026 school year, please check out our new [Balloon Flight Opportunities](#) webpage. Opportunities are available for K-12 schools, college groups, and science fair projects.

We have room for up to six K-12 flights this coming school year. We anticipate conducting 2–3 flights in the fall and another 3–4 in the spring. Teachers must fill out our online request form, which will remain open as long as spots are available. Any college and science fair flight requests will be handled separately on a case-by-case basis. College groups must submit a flight proposal and online application. Meanwhile, students or teachers interested in using our program for a science fair project should reach out to use directly via email. For both, flight availability may be limited depending on prior ballooning commitments.

Website Updates

Over the last 12 months, we have continued to work on improvements to our balloon program webpages. One of the biggest improvements we made was updating and reorganizing our [High-Altitude Ballooning 101](#) page, including adding new content and breaking everything up by topic onto different pages.

We also created a related *Educator's Guide to High-Altitude Ballooning* PDF that teachers can download and/or print out for their own use. All of these efforts are intended to help teachers better understand how our K-12 program works and guide their students during the payload development process. Teachers can find even more resources on our new [K-12 Flights](#) page, including downloadable files related to brainstorming student payload ideas and experiments, building and developing sensors, and calculating lift.

Our new [College Flights](#) page provides information for college students and faculty who are interested in using our balloon program for their research or educational efforts. This is open to individuals or groups from the University of Wyoming and all Wyoming community colleges. At this time, we are requesting that interested parties submit a flight proposal at least three months prior to the proposed flight date. Given our funding limitations and priority for K-12 flights, we strongly recommend that proposals include at least partial funding to cover flight costs.

Finally, if you're interested in learning more about all the college-level ballooning efforts we've been a part of, we now have a dedicated [Ballooning Projects](#) page on our website. Here, you can find an archive of information and content related to previous projects such as the Nationwide Eclipse Ballooning Project (NEBP) and LIFT Project.

BALLOON LAUNCH HIGHLIGHTS

During the 2024–2025 school year, we conducted six high-altitude balloon flights. Five of these were regular K-12 flights carrying student payloads that were launched from schools, while the sixth was simple a radiosonde flight during the Wyoming Space Grant's STEM

Saturday event in May. Highlights from the five K-12 flights are given below.

Dubois K-12 School (Dubois)

In early October, we conducted our first ever balloon flight out of Dubois, on the western edge of the Wind River Reservation. We were hosted by one of the high school teachers at Dubois K-12 School. With fire season still in full swing, and the large Pack Trail Fire raging just ~20 miles west of town, the student participants focused many of their payload experiments on measuring air quality due to the wildfire smoke.



During the 2-hour flight, our onboard video cameras were able to capture some incredible footage from high above the Wind River Range. The smoke plume was easily visible on this clear day, as were Gannett Peak (and the surrounding glaciers), the Tetons, and Yellowstone Lake. The balloon eventually burst at over 95,000 feet above sea level. Following its descent, the payload landed on private property near Crowheart, about 24 miles southeast of Dubois. We uploaded two videos of the flight to YouTube (see links below), including a 360° VR video that has had over half a million views!

[Highlight Video](#) / [360 Video](#) / [Flight Tracker](#)

Pathfinder High School (Lander)

By mid-November, we were back in west-central Wyoming for another balloon launch, this time at Pathfinder High School in Lander.



This flight was unique in that it was the first time we ever flew science fair projects. The students developed three projects as part of their payloads. One project sought to obtain direct measurements of particulates lingering in the atmosphere from the wildfires earlier that fall. Another was designed to measure changes in atmospheric ozone as a function of altitude. The third project used a system of gimbals to attempt to stabilize an accelerometer during flight. Of these three projects, two ended up



making it all the way to the state science fair in March 2025.

After a nearly 2-hour flight, the payload landed on the BLM east of Riverton, about 39 miles northeast of the launch site. During its ascent, the balloon reached a maximum altitude of almost 91,500 feet above sea level. Once again, our onboard video cameras captured awesome footage of the flight, which we compiled into a ~5-minute video to highlight the event.

[Highlight Video](#) / [Flight Tracker](#)

Highland Park Elementary School (Sheridan)

We opened the spring semester by traveling up to Sheridan in early February for a launch at Highland Park Elementary School. Little did we know that this would end up being one of our most memorable high-altitude balloon events to date. To begin, launch day was very cold. A dense Arctic airmass had spread across much of the northern Great Plains and daytime high temperatures in many areas over the low country of northern Wyoming struggled to get above single digits. In fact, the launch site was a frigid 0°F that morning, easily making this the coldest balloon launch we've ever done.

However, the Arctic airmass was quite shallow and capped by a strong temperature inversion. This meant that if you wanted to warm up, all you had to do was gain some altitude. Indeed, less than two minutes after launch, the ambient air temperature measured by sensors on our payload rose from -5°F at an altitude of 5,600 feet above sea level (~1,600 feet above the ground) to a balmy 47°F only 600 feet higher. This 52-degree increase occurred in just 45 seconds of flight time. Remarkable!

As the balloon continued to rise, it maintained an average ascent rate of only about 820 feet/minute, which is a tad slow compared to our target ascent rate of ~1,000 feet/minute. As



a result, the balloon took just over 2 hours to reach its burst altitude of 102,900 feet, our highest since 2021. About 24 minutes later, the payload was back on the ground. Well, sort of.

The landing spot was on a private ranch 1.3 miles off a county road, nearly 30 miles north of Moorcroft, WY, and over 100 miles from Sheridan. Upon reaching the area, it became obvious that we would need to contact the landowner for permission to access their property. However, we were unable to find the payload through our binoculars, despite having what we thought was a direct line-of-sight view from the road. Then, after several minutes of searching, there it was, draped across one of the power lines out in the pasture. Unbelievable!

This turned what would have been a rather straightforward recovery (had it just landed on the ground like normal) into a much more complicated process. Not only did we need to get in touch with the landowner, we knew that

we would also likely need to contact the power company to have them come out and safely remove the payload. By now it was already early afternoon and, being February, the sun would be setting in just a few hours. Time was seemingly not on our side.

However, after some phone calls and texts, we were able to finally speak with the ranch manager who agreed to come up from Gillette and escort us onto the property. Once he arrived, we drove out to the payload in shin-deep snow and determined that the power company would indeed need to be called. To our relief, the ranch manager knew some guys who worked for the power company and was able to arrange for them to arrive just after sunset. They were able to safely cut down the payload and return it to us by 6:30pm, about 9 hours after launch. What a day it had been!

[Highlight Video](#) / [Flight Tracker](#)

Eastside Elementary School (Cody)

Our first ever balloon launch from Cody took place in mid-March, from Eastside Elementary School. We were able to sneak it in on a relatively calm morning following a weak late winter snowstorm that dropped 4–6 inches of snow across parts of the Big Horn Basin. Unlike the previous flight out of Sheridan, this one was relatively uneventful. Our balloon carried the nearly 12-pound payload up to an altitude of



just over 90,000 feet. After initially flying in a northeast direction, strong easterly winds in the stratosphere pushed the balloon back toward the west before it burst. This type of change in the wind pattern is known as a stratospheric wind reversal and is actually quite common.

As a result of the wind reversal, the payload didn't travel all that far and ended up landing only a hundred feet from a county road near Powell, WY, just 23 miles from Cody. The total flight time was 1 hour 56 minutes. Given its favorable landing spot, recovery of the payload was much easier this time around.

[Highlight Video](#) / [Flight Tracker](#)

Riverton Middle School (Riverton)

For our last high-altitude balloon flight of the school year, we visited Riverton in early May to launch at Riverton Middle School, one of our repeat hosts. This would be our fourth launch with this school since 2019. One of the best parts about launching with these folks is that they always bring a bunch of students out on the recovery with us. This time was no different.

The launch itself went off without a hitch. The prevailing winds in the upper atmosphere carried the balloon southeastward toward the Beaver Rim area, which is where we expected the payload to land. We drove our caravan of vehicles south out of town on state highway 135 and stopped at a large turnout on the side of the road to see if we could catch a glimpse of the balloon in flight. Sure enough, the clear blue skies that morning allowed us to easily see the balloon with the naked eye all the way up to its burst altitude of over 97,700 feet!



The payload eventually landed on a section of public land about 22 miles southeast of town, 2 hours 13 minutes after launch. Getting to the landing area, however, was not trivial and required a bit of thoughtful navigation through a series of soft dirt roads and two tracks across rugged terrain on the north side of Beaver Rim. Several questionable creek crossings were needed as well. Thankfully, our 4WD Suburbans were more than capable of handling it. One thing we know for sure is that the students had a blast.

[Highlight Video](#) / [Flight Tracker](#)

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