WY Space Grant Consortium
FY 2010 Performance Data

Consortium Contact Information

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Grant Type: Capability Enhancement

Number of each type of affiliate in consortium

Affiliate Type	Number
Institutions of Higher Education (Bachelor's and/or Graduate Degrees)	1
Institutions of Higher Education/Community College/2 year Institutions	7
Total Academic	8
Government (Federal/State/Local)	1
Industry	1
Museum/Science Center/Planetarium	1
Other Non-profit organization	0
Other	1
Total non-Academic	4
Total Affiliates	12

Number of academic affiliates in consortium that currently meet the following classifications:

Affiliate Classification	Number
HIS - Hispanic Serving Institution	0
HBCU (Historically black College or University)	0
OMU - Other Minority College/University	0
TCU - Tribal College or University	0
Institution Serving primarily Women	0
Academic Inst. for Persons w/Disabilities	0
Total	0

Fellowship/Scholarship Performance Data Summary

General Description of Fellowship/Scholarship Projects

Projects include: Graduate and Undergraduate Research Fellowships (Fall and Spring), Summer Research Fellowships for Winston-Salem State University Undergraduates, NASA Internships, UW Moonbuggy Team, CC Transfer Scholarships, and CC STEM Scholarships run by our seven community college affiliates. The overall goals of the fellowship programs are to 1) increase and improve opportunities for research experience and internships for graduate and undergraduate students, 2) encourage and retain college students in STEM majors, 3) maintain the diversity in fellowship/scholarship programs to greater than or equal to the demographics of enrolled higher education students in the state of Wyoming, 4) recruit community college students to get involved in Undergraduate Research Fellowships and WSGC programs, and 5) support STEM workforce development in Wyoming through real-life, hands-on experiences. The objectives of the Graduate Research Fellowships are to increase the students' research productivity (in areas in line with NASA interests and strategic goals) by allowing them to concentrate all of their efforts on their research. Stipends for M.S. students are $13,500 for the academic year and $1,500 for one month of summer research. Stipends for Ph.D. students are $18,000 for the academic year and $2,000 for the summer. All graduate students receive a tuition and fee waiver and student health insurance. We awarded seven Graduate Research Fellowships for 2010. For undergraduates, the objectives of the Research Fellowships are to interest students in research careers in science, math, and engineering by exposing them to research firsthand. Fellowship projects should include 1) a well-defined research objective that can be achieved within a limited time frame, 2) opportunities for the student to learn new skills, 3) experience in the process of real scientific research, 4) interaction with a mentor and other professional scientists, and 5) opportunities to present the research at a conference or in a peer-reviewed publication. Students can request up to $5,000 for their project. In 2010, we awarded 15 students Undergraduate Research Fellowships through three Projects: 1) Undergraduate Research Fellowship – Engineering Senior Design; 2) Undergraduate Research Fellowship – STEM Research; and 3) Undergraduate Summer Research Fellowship – WSSU. The main objective of the NASA Internships is to expose undergraduate and graduate students to the work environment at NASA Centers with the hope of interesting them in a career as a NASA scientist or engineer. Another

objective is to stimulate their interest in science/engineering in general and to expand their knowledge of career options. The Internship programs are particularly important for Wyoming undergraduates, many of whom have limited experience traveling in other parts of the US or living in major population centers. Participation in one of these internships can be an eye-opening experience for Wyoming students. Summer interns usually receive $6,500 in funding. We awarded five 2010 NASA Summer Internships at NASA Centers (JPL-1 student, JSC - 2 students, Marshall – 1 student, and Goddard-1 student). WSGC sponsors a UW Moonbuggy Team each year. The Moonbuggy is a project students can pick for their Senior Design requirement in Mechanical Engineering. In this project, teams face the engineering challenge of designing a vehicle that can navigate on the lunar surface. Students design and build a human powered vehicle that can carry two people on a surface similar to the moon for half a mile. Upon completion, teams compete in the NASA Great Moonbuggy Race in Huntsville, AL. The intent of the Moonbuggy experience is for students to gain real-life, hands-on experience in engineering and in working as part of a team. Students also get to travel to the US Space and Rocket Center in Huntsville, AL as an added incentive to compete with teams from around the world. In 2010, five students took part in the Moonbuggy Team. Our Community College Transfer Scholarships are designed to retain high quality Wyoming community college students in STEM fields, particularly those from underrepresented groups, and to enable them to succeed in pursuing 4-year STEM degrees at the University of Wyoming. Awards consist of $5000 to be applied toward tuition and fees, books, supplies, and school-related expenses. We awarded five 2010 Community College Transfer Scholarships to students transferring from Wyoming community colleges to the University of Wyoming, majoring in STEM fields. Our community college scholarship programs are aimed at encouraging Wyoming students beginning their studies in math, science, and engineering, to continue with a 4-year degree and eventually a career in science. Additional objectives for this program are to reach out to students from underrepresented groups and help them to overcome potential barriers to success in pursuit of their STEM educational goals. Awards are generally $1000 for the academic year to be used for school-related expenses. Fifty-three Community College STEM Scholarships were awarded in 2010: Casper College-7; Eastern Wyoming College-9; Central Wyoming College-4; Laramie County Community College-18; Northern Wyoming Community College District-9; and Western Wyoming Community College-6; Northwest College made no awards in 2010.

Total Number of Fellowship/Scholarship Projects: 14

Comparison of FY2009 to FY2010 Student Data Tables [Fellowship/Scholarship]:

There is a negligible variance in the number of fellowship/scholarship awardees in 2009 compared to 2010. In 2009, we had a total of 88 student awardees and in 2010, there were 90 student awardees. At the time of the Progress Report, we were recruiting summer 2011 (FY2010) students from WSSU. They were not reported at that time because they had not been identified, but are counted in this report. Changes in gender demographics and in demographics from underrepresented populations are minor and fluctuate from year to year.

Research Infrastructure Performance Data Summary

Total number of projects: 4
Total number of affiliates involved in projects: 0
Total number of non-affiliate organizations involved in projects: 1

Affiliate Members Participating:

None in FY2010

Non-affiliate organizations participating:

Wyoming Women's Expo, NASA and NSF EPSCoR, UW Readership Program, UW Physics and Astronomy Dept., NASA Space Radiation Laboratory at Brookhaven, University of Texas-Arlington, USDA-ARS High Plains Grassland Research Station

General Description of Research Infrastructure Projects:

The projects supported in Research Infrastructure include: Faculty Research Initiation Grants, Undergraduate Research Day, Speaker Series, and Travel Grants. One of the primary goals of Wyoming Space Grant is to stimulate research related to NASA priorities within the state of Wyoming. One strategy we use to accomplish this goal is to provide Faculty Research Grants. Awards are made to faculty with outstanding proposals for innovative and interdisciplinary research. Incorporating undergraduate and graduate students is encouraged. Relevance to NASA strategic research priorities is considered in evaluation of the proposals. Preference is given to newer faculty members, women, minorities, and faculty initiating research in a new field. These seed grants are intended to assist Wyoming researchers in competing for NASA or other funding by establishing baseline data, so larger grants and collaborations can be pursued. In 2010, five awards were made. The funded projects include: 1) Carl Frick, Mechanical Engineering Department, University of Wyoming, "Size Dependent Compressive Behavior of Body Centered Cubic Metals"; 2) Mark Mehn, Chemistry Department, University of Wyoming, "Mitigating the Effects of Ionizing Radiation with Manganese Supplements"; 3) Qian-Quan Sun, Zoology and Physiology Department, University of Wyoming, "Mechanisms of simulated microgravity-induced brain plasticity"; 4) Daniel Tinker, Botany Department, University of Wyoming, "Estimating Future Forest Structure and Carbon Balance Following a Mountain Pine Beetle Outbreak in Lodgepole Pine Stands in Southeastern Wyoming"; and 5) David Williams, Renewable Resources Department, University of Wyoming, "Land cover change in rangelands: impacts of an invasive species (Linaria dalmatica) on carbon dynamics and evapotranspiration". Undergraduate Research Day is a campus-wide event held every April to showcase undergraduate research done at the University of Wyoming and Wyoming community colleges. Students must submit an abstract to be considered. Most of our Undergraduate Research Fellows, Interns, Moonbuggy Team, and Rocket Science Team present their research at the event. This is a great opportunity for undergraduates to learn how to put together a talk or poster and then present their research to their peers and fellow scientists. In April 2011, approximately 300 students presented their research at Undergraduate Research Day. Bringing speakers to Wyoming helps to enhance awareness of NASA interests and research areas, increases proposal submissions to NASA for research and collaboration, and encourages greater involvement of Wyoming researchers in NASA-funded research areas. A secondary goal is to bring speakers to

talk about NASA missions and initiatives, with the goal of raising public awareness of NASA programs and increasing interest in space science and technology careers on the part of students (K-12 and college) in the state. In 2010, Wyoming Space Grant helped sponsor four speakers: 1) Jeff Shields, University of Nebraska, "Welcome to the Small Time: Structure and Properties of Nanoclusters"; 2) Kenneth Chang, New York Times, "The Future of US Space Exploration"; 3) Joyce Winterton, NASA, Wyoming Women's Expo; and 4) Matthew Povich, Pennsylvania State University, "Calibration of Star Formation Rates in Galactic Giant Molecular Cloud Complexes". Approximately 69 people attended the talks, including faculty, post-docs, research scientists, graduate students, and the public at large. This year we started a new program to provide small travel grants for students and faculty. Faculty members, graduate students, and undergraduate students may apply for funding to present at local and national scientific conferences in their disciplines. This funding is intended to help offset the costs of traveling to scientific meetings and to provide access to students and faculty who would otherwise not be able to attend.

Research Infrastructure Non-Student Participant Data (by Gender)

	Male	Female	Total
Faculty	20	3	23
Other Participants	10	26	36
Total	30	29	59

A description of "Other Participants" if applicable:
Speakers and attendees for talks (post-docs, research scientists, and public at large)

Research Infrastructure Underrepresented Minority Participants:

	Male	Female	Total
Faculty – Underrepresented	0	0	0
Other Participants – Underrepresented	0	0	0
Total	0	0	0

A description of "Other Participants" if applicable:
N/A

Research Infrastructure Non-Student participants with physical disabilities

Male Person(s) with Disabilities: 0
Female Person(s) with Disabilities: 0
Total Person(s) with Disabilities: 0

Higher Education Performance Data Summary

Total number of projects: 4
Total number of affiliates involved in projects: 2
Total number of non-affialiate organizatopns involved in projects: 3

Affiliate Members Participating

Casper College, Casper Planetarium

Non-affiliate organizations participating:

NASA EPSCoR, UW Physics and Astronomy Dept., UW Engineering Dept., UW Botany Dept., UW Honors Program, UW College of Agriculture and Natural Resources Global Perspectives Program, UW Haub School of Environment and Natural Resources, NASA Wallops, RockSat Program

General Description of Higher Education Projects:

Projects in Higher Education include: 1) Faculty Education Enhancement Grants, 2) Astronomy Workshops for Teachers, 3) Student Satellite Projects, and 4) Student Organizations – Minority Student Institutions. Faculty Education Enhancement Grants are for faculty to work on development of a new course or the substantial updating of existing courses to better prepare students for careers in STEM fields and fields relevant to NASA interests. Three awards were made in 2010: 1) Mark Garnich, Mechanical Engineering Department, University of Wyoming, "Advanced Finite Elements"; 2) Scott Shaw, Department of Renewable Resources, University of Wyoming, "Teaching and Research for Undergraduates in the Andes of Eastern Ecuador: Tropical Cloud Forest Ecology"; and 3) Jeffrey Hamerlinck, Geography Department, University of Wyoming, "Redesigning Map Use & Analysis: Laboratory Development and Information Literacy Integration." The Astronomy Workshop for Teachers seeks to improve the teaching and learning of mathematics and science at the 4-8 grade levels by improving teacher skills. In order to effectively teach science, teachers must have theoretical and practical knowledge about science learning and teaching. Teachers are exposed to activities that integrate inquiry, mathematics, and statistics with hands on astronomy. Participants review current research pertaining to best practices in science education and develop 2-5 classroom activities to align with research and education standards. The teachers work to develop activities that will stimulate student inquiry and help students seek answers following the principles of the scientific method. Developed activities are evaluated and tested with students enrolled in the Astronomy Camp for Kids program offered by the Casper Planetarium. Copies of developed activities are kept at the Casper Planetarium and made available to educators. Participants are encouraged to present their activities at the annual Wyoming Science and Mathematics Teachers' Conference held at Casper College. During the school year teachers can continue the program by teaching in an afterschool science program at the Casper Planetarium. Space Grant funding helps to pay stipends to the teachers. In FY2010 five teachers were funded, two during the school year and three in the summer (summer participants were not reported on the Progress Report because they hadn't been identified). The Student Satellite project involves the creation of opportunities for students to gain firsthand experience in conception, design, construction and launch of satellite instruments. The goals of this program are to stimulate student interest by involving them in a "real" project,

to provide an opportunity to "apply" concepts learned in physics and engineering classes, and to involve students in a "project" oriented learning experience to simulate what goes on in industry. In 2010, a senior-level Rocket Science course at the University of Wyoming, based on the Rock On workshop, was funded by WSGC to help students develop components of a rocket payload. Eight students participated in the class and several attended the rocket launch at Wallops. Wyoming Space Grant is working to expand its impact on minority students within the state of Wyoming and to develop partnerships with Minority Serving Institutions elsewhere. In FY2010 we developed a partnership with Winston-Salem State University, a HBCU and piloted a summer research program for undergraduates. In the summer of 2010 five students were supported under this program (reported in FY2009 with no-cost extension funding). In summer 2011 three students participated in the program, two funded by WSGC and one by the UW School of Energy Resources. These students will be reported in FY2010. They were not included on the 2010 Progress Report, because the students hadn't been identified at the time. We are also continuing to develop relations with student organizations and program offices (both at UW and around the state) to strengthen minority student achievement in STEM fields and to enhance recruitment of students from underrepresented groups.

Higher Education Non-Student Participant Data (by Gender)

	Male	Female	Total
Faculty	4	0	4
Other Participants	4	7	11
Total	8	7	15

A description of "Other Participants" if applicable:
Instructors and teachers involved in the Astronomy Workshop at Casper College - Casper Planetarium

Higher Education, Non-Student, Underrepresented Minority Participants

	Male	Female	Total
Faculty – Underrepresented	1	0	1
Other Participants – Underrepresented	0	1	1
Total	1	1	2

A description of "Other Participants" if applicable:
Instructors and teachers involved in the Astronomy Workshop at Casper College - Casper Planetarium

Higher Education participants with physical disabilities

Male Person(s) with Disabilities: 0
Female Person(s) with Disabilities: 0
Total: 0

Higher Education Output Data

Total Number of New Courses (supported by Space Grant): 1
New Course Descriptions:
1. G&R2150 - Map Use and Analysis. Survey of the use of maps to communicate ideas and opinions about places, and the analysis and presentation of mapped data to solve spatial or geographic problems. Use of satellite images for mapping. University of Wyoming.

Total Number of Revised Courses (supported by Space Grant): 2
Revised Course Descriptions:
1. ME5045 - Advanced Finite Element Analysis. Advanced topics in finite element analysis with emphasis on mathematical foundations of the method, numerical algorithms for software implementation, and analysis of problems with material and geometric nonlinear behavior. University of Wyoming. 2. HP4152-1 - UW Honors Program Senior Seminar: Cloud Forest Ecology in Ecuador.The class provides UW honors students (from any major or discipline) with a unique opportunity to live and learn in a tropical cloud forest, to study and participate in on-going tropical ecological research, and to experience for themselves the thrill of discovering new life forms. This multi-disciplinary experiential-learning class allows UW students the opportunity to study forest ecology and environmental change at a high-elevation cloud forest in the Andes Mountains. The class engages UW undergraduates directly in an on-going NSF-funded research project. During travel to the forest study site, students visit the ancient city of Quito, providing them with cultural experiences for University Studies Program (USP C1 credit).

Please describe or provide example(s) of collaboration between the Colleges of Education and the Science and/or Engineering Colleges/Departments that exist in institutions throughout your consortium (directly attributable to Space Grant effort/intervention). These examples can be new or long-standing relationships developed prior to FY2010. Additionally, provide a brief summary of the outcome or benefit resulting from the collaboration. If there are no such collaborations that can be directly attributed to efforts made by your Space Grant Consortium, enter N/A.
The Wyoming NASA Space Grant Consortium has a good working relationship with the UW Department of Education and the Science and Math Teaching Center (SMTC) which is housed within the department. Each year the SMTC organizes the State Science Fair which is held at the University of Wyoming. Space Grant provides awards to science fair students and recruits students and faculty from departments across campus to help with judging. Additionally, the UW Physics and Astronomy Department and the WSGC provide a “Science Night” for students and teachers the night before Science Fair kicks off. Last year, the WSGC awarded a graduate fellowship to Trent Mankowski, who had a joint appointment in both the Department of Education and the UW Physics and Astronomy Department. His project involved building Wyoming’s capacity for secondary school space science instruction and also getting the public engaged in astronomy through programs such as Galaxy Zoo. Trent was also our NASA Student Ambassador and traveled throughout the state doing space science talks and outreach. We have also worked with Dr. Tim Slater, the UW Excellence in Science Education Chair, to support a M.S. in Teaching program with an emphasis in Astronomy. Bob Mayes, the Director of the SMTC serves as a committee member for review of the Faculty Education Grants awarded by WSGC and he regularly attends our Space Grant Board Meetings to give input. Last Fall, we

invited Tony Leavitt, part of the NASA AES program to the university to work with pre-service teachers in the SMTC program. We have collaborated a great deal with the SMTC and the Department of Education and we will strive to work with them more in future programs.

NASA Education Outcome 1 Results

An anecdotal single point of success in terms of NASA workforce development:

The following are anecdotal evidence of the success of the Wyoming NASA Space Grant programs and its students. 1. Michael Lundquist, a 2010 WSGC Graduate Fellow, "was selected to conduct research aboard NASA's powerful Stratospheric Observatory for Infrared Astronomy (SOFIA), a 20-ton telescope mounted in the rear fuselage of a highly modified Boeing 747SP aircraft. Lundquist was among the first scientists chosen to fly on SOFIA to record infrared images of dust and gases in a region where the star-formation process is in its early stages." Press release: http://www.uwyo.edu/uw/news/2011/06/uw-student-among-first-researchers-on-nasa-flying-observatory.html. 2. Levi Lowder, one of our 2010 WSGC Graduate Fellows, has applied for a patent with his advisor as the result of his research over the past year. He has also been invited by several organizations to talk about his research in the area of renewable resources, manipulating algae to produce energy. Levi also helped judge Science Fair. 3. Trent Mankowski started as a WSGC Undergraduate Fellow, doing research in a Physics and Astronomy lab at the University of Wyoming. Since then, Trent has graduated with his B.S. in Physics and Astronomy, M.S. in Education, and has decided to pursue a Ph.D. in Science Education. In FY2010 Trent was funded by a WSGC Graduate Research Fellowship to help build Wyoming's capacity for secondary school space science instruction and also to engage the public in astronomy through programs such as Galaxy Zoo. Trent was also our NASA Student Ambassador and traveled throughout the state giving talks and doing space science outreach. 4. A teacher from Arapaho Charter High School, a school district with a large Native American population on the Wind River Reservation, brought two high school students to Laramie for our annual Women in Science event. This is a quote from the teacher: "The two students I brought to UW underwent a transformative experience. Not only were they amazed and stimulated by the variety of workshops and talks, they also began to visualize the possibility of attending a "large" 4-year college to pursue interests in science/technology fields. It had been many months since I felt that good as a teacher. It had a unique value for those young women." 5. This summer we were able to continue the program we started last year with Winston-Salem State University. We were able to bring three students to Wyoming for the summer for research (one student funded by the UW School of Energy Resources). One of the previous students in the program stated that after the trip to Wyoming she decided to explore other schools in other states for graduate school that she would probably never have considered before this experience. Another student commented that she had the time of her life and would love to come back. Yet another student commented that this is the first time she has had positive experiences with "white people" and it has opened her mind in that regard. Most of the recruiting this year was done through word of mouth and was very successful. Press release for the 2011 summer program: http://www.uwyo.edu/profiles/extras/nasa-undergraduate-fellowship-diversity.html. 6. Shana Wolff is another WSGC success story. Shana started out at Laramie County Community College, where she received several WSGC scholarships for academic

excellence. She graduated with her A.S. degree from LCCC and transferred to the University of Wyoming. She applied for the WSGC Community College Transfer Scholarship, a very competitive scholarship and received an award. Since transferring to UW she has already published a paper in a peer-reviewed journal and plans to apply for an Undergraduate Research Fellowship with WSGC for next year. After that Shana plans to pursue her Ph.D. 7. WSGC Director Paul Johnson, has taught a Rocket Science class for the last three years. In the class students get hands-on experience building a rocket payload and get to attend the rocket launch at Wallops. Many students have commented that this is the first time that they feel they are really getting to use the knowledge they have learned in classes and to get real-life experience. 8. Space Grant helps fund an Astronomy Workshop at Casper College in partnership with the Casper Planetarium. During the school year teachers from the program continue their training in an afterschool science program at the Casper Planetarium. The following is a letter from Charles Walker, one of the teachers in the program: "The Casper Planetarium has been a rewarding yet challenging experience for me. When Justin and I first started working there I was a bit nervous. There were several instances where I had no idea what to do. I have never really done anything like this before and I really enjoyed it. The kids really brought out a new side of me and it made me really excited. Basically what we did was plan a lesson and teach the kids for about an hour and a half. Justin and I work really well together and had fun "team teaching" the kids. The kids were very challenging at times but really grew us as teachers. I really enjoyed the fact that Michelle let us teach on our own and make our own mistakes. Even though she knew that we could do some things better or differently she let us "experiment" with our own ways and let us figure it out for ourselves. I really like the helpful advice from Michelle and she was a great asset to our success at the Casper Planetarium. The kids at the Casper Planetarium are what made going to work and preparing for work so rewarding. It wasn't leaving or just receiving a check every month, it was seeing the kids' faces when they would make something that they did not think they could make, or make new friends, or feel at home when they need it most. Those kids mean so much to me and it made all the difference in the world to see how excited they were to come spend the afternoon with us. They would just randomly come give me a high **five** and let me know how much they appreciated me. One of the rewarding experiences for me as a teacher was to see the kids finally work together as a team. One of the things we really stressed was teamwork. I felt sometimes it felt impossible to get everyone to work together as a team. Sometimes it meant not doing what we planned and allowed for variable change. That is one thing that I learned - always have more than one backup plan because you never know how many kids you will have or how they will act. Some days we would only have two kids and we would have planned for over six kids and we would have to either change the lesson plan or adjust it. Overall I really enjoyed this amazing experience working at the planetarium with all of these kids. There are many different things that I could suggest for teachers and I think the best way to get a feel for teaching is to actually do it and make the mistakes yourself. I believe that is the best way to learn. It is great to have the encouragement from Michelle and her helping us along the way. She gave us what we needed at the exact time and let us go by our own will. I could not thank the planetarium enough for what they have done and sacrificing their own time and supplies to help us out. It was very rewarding and I would not give up the experience for anything."

Total Number of authors that have published results: 11
Total Number of authors that have submitted manuscripts, but are not yet published: 2

Total Number of invited papers that were presented: 4
Total Number of self-submitted papers that were presented at conferences that use a review process: 7

Total Number of patents that have been applied for: 1
Total Number of patents that have been granted: 0
Total Number of patent licenses that have been issued: 0
Total Number of technology transfer activities: 0

Proposals developed (supported) by Space Grant for funding from other sources and attributable to Research Infrastructure and Higher Education Programmatic elements

Total Number of Proposals Submitted: 0
Total Funding Request via Proposals Submitted: $0
Total Number of Proposals Won: 0
Total Funds Won by Successful Proposals: $0

Total Number of Direct Participants that were Pre-Service Teachers: 5
Total Number of these Pre-Service Teachers that received direct support in the form of a monetary award: 5
Total Number of "significant awardees" from 2010 that did not receive direct monetary support (but their experience was greater than or equal to 160 contract hours): 16

Comparison of FY2009 to FY2010 Student Data Tables [Direct funded participants]:

When comparing the Student Data Tables between FY 2009 and FY2010 there is very little difference. In 2009, we had a total of 88 student awardees and in 2010, there were 90 student awardees in the Fellowship/Scholarship programs. Similar numbers of participants were involved in Higher Education and Research Infrastructure programs between the two years. One difference that is seen in these categories is the number of students receiving funding. We started a new program this year to provide small travel grants ($250) to students traveling to scientific conferences. This constitutes the reason for the increase in funded students between the years. Changes in gender demographics are minor and fluctuate from year to year. Additionally, there was no real difference in the number of awards given to students at affiliate institutions between the two years. In 2009, 51 awards were given and in 2010, 53 awards were given for Community College STEM Scholarships. The awards given by each institution differed slightly between the two years, but that is related to numbers of applicants and funding distribution based on enrollment. In the FY2010 Table A.3. we have added an additional institution. We have started an undergraduate research program with Winston-Salem State University, a HBCU, and we had two WSSU students participate this year. Longitudinal tracking data is similar between years, however, we did lose track of six previous students in the Fellowship/Scholarship category and five students in the Higher Education/Research Infrastructure category. We will continue to try to track them down.

Comparison of FY2009 Performance Data Report to FY2012 Submission:

Expenditure summary: There are slight differences between years in expenditures per category, which can be accounted for by an increased budget in FY2010. The greatest increase was observed in the Fellowship/Scholarship category which is attributable to adding several new programs to this category: the Moonbuggy Team, the WSSU program, and the addition of Northwest College as a community college affiliate. Publications: The number of publications and presentations reported is similar from FY2009 to FY2010. Patents: One patent was submitted this year by one of our Graduate Fellows. None were submitted in 2009. Proposals submitted or won: In FY2009 one of our Faculty Research Grant recipients submitted and was awarded an NSF grant based on his WSGC research. No faculty reported submitting or receiving new grant funding related to WSGC research in FY2010. New and revised courses: In FY2009, 6 new or revised courses were reported. In FY2010, 3 new or revised courses were reported. In FY2009, one of our community college faculty members revised and updated four chemistry laboratory courses as part of her Faculty Education Grant, which accounts for the difference. Faculty participation: Faculty numbers have increased slightly from FY2009 to FY2010 (17 in 2009, 27 in 2010). This is mainly due to an increase in the number of speakers funded and attendance at the talks. The number of women and underrepresented groups is similar. Evaluation strategy: Evaluation strategies have largely remained the same.

Precollege Performance Data Summary

Total number of projects: 6
Total number of affiliates involved in projects: 6
Total number of non-affialiate organizatopns involved in projects: 63

Affiliate Members Participating

Central Wyoming College, Western Wyoming Community College, Eastern Wyoming College, Casper College, Casper Planetarium, Sheridan College

Non-affiliate organizations participating:

Denver Zoo, Paul Smith Children's Village – Cheyenne Botanic Gardens, UW WWAMI Program, USGS, Wyoming Game & Fish, National Weather Service, NOAA, UW Ecology Program, UW Zoology & Physiology Dept., UW Chemistry Dept., UW Science Posse, UW Botany Dept., UW Statistics Dept., UW Physics & Astronomy Dept., UW Engineering Dept., UW Berry Biodiversity Conservation Center, Laramie Reproductive Health, UW Admissions Office, UW Health Sciences Center, UW Renewable Resources Dept., UW School of Energy Resources, UW INBRE Program, UW NSF EPSCoR, UW College of Agriculture, UW Haub School of Environment and Natural Resources, Wyoming Women's Foundation, UW College of Education, UW Foundation, UW Academic Affairs Office, UW President's Office, UW College of Arts & Science, UW College of Business, Converse County School District (Douglas Middle School, Douglas High School, Glenrock High School, South High School), Laramie County School District (Cheyenne East High School, Johnson Jr High School), Washakie County School District (Worland High School), Platte County School District (Wheatland High School, Glendo Jr High School, Glendo High School), Fremont County School District (Shoshoni High School,

Starrett Jr High School), Albany County School District (Laramie Jr High School, UW Lab School, Laramie High School), Goshen County School District (Torrington High School, Southeast School), Carbon County School District (Cooperative High School), Natrona County School District (Centennial Jr High), Sweetwater County School District (Green River High School, Wamsutter Schools), Astro-Science Camp in Dubois, UW Extension-Sublette County 4-H, Lights On in Lander, Sagebrush Elementary, Little Snake River Valley School, Lusk Middle School, Sheridan Jr High School, Lincoln County 4-H, Clear Creek Middle School, Kaycee Middle School, Exxon Mobile Bernard Harris Summer Science Camp, UW Planetarium, Journey School-Teton Science School, NASA Aerospace Education Specialist Program, UW Science & Math Teaching Center, Sheridan County School District – Sci Fri Program, NASA Summer of Innovation Program, NASA WY ERC, KGWN CBS Channel 5 News – Cheyenne, Laramie County Community Partnership, Brown and Gold

General Description of Precollege Projects

Precollege projects include: 1) Women in Science, 2) AstroCamp, 3) State Science Fair, 4) Robotics, 5) Teacher Education Resources, and 6) NASA Educator Resource Center. Women in Science Conferences are for students in grades 7-12 to learn firsthand about careers in science and technology from female scientists. The purpose of the forum is to provide role models and mentors to young women interested in science and engineering and to encourage all students, especially young women and minorities, to pursue higher education and careers in STEM fields. In 2010-2011, two Women in Science Conferences were held – one at Central Wyoming College and one at the University of Wyoming. Close to 300 students and teachers attended the event at Central Wyoming College and close to 400 students and teachers from around the state attended the conference at the University of Wyoming. At the UW event students heard from a keynote speaker, Kim Insana, the CBS Channel 5 Meteorologist. Students spent the remainder of the day visiting science labs, doing hands-on experiments, and meeting scientists. Each student received information on careers in science and on attending college. The Exxon Mobile Bernard Harris Summer Science Camp – Wyoming Astrocamp includes junior high students, teachers, and scientists working together to understand the universe through hands-on experiments and activities. The camp is held at the University of Wyoming. Campers work with UW astronomers, observe at telescopes, explore hands-on physics demos, launch rockets, and are immersed in all of the sciences. They are also encouraged to see college as an exciting part of their future. Students are provided with information about college, classes, and extracurricular activities they should be involved in during high school in order to excel in college. During the camp middle and high school science teachers work with UW astronomers and students teaching, participating in research, and developing curriculum. In 2010, 48 students and four teachers attended, and 10 counselors participated. State Science Fair targets junior high and high school students interested in STEM disciplines. Science fair fosters the abilities to develop and present science projects. The two-day event is held at the University of Wyoming. WSGC provides funding, informs teachers about WSGC programs, and gives awards to outstanding student projects in space science and physics. Giving awards actively supports student retention in STEM fields. Providing assistance, resources, and feedback encourages promising students to further pursue education and career opportunities in STEM disciplines. In March 2011, 357 students attended State Science Fair. For reporting purposes, the 16 students that received awards (two were team awards) and our undergraduate and graduate student awardees who volunteered their time to judge science fair have been counted as Direct Participants. The Robotics program encourages

interest in engineering, technology, and teamwork and aids in development of science skills. In 2010 we funded the Casper Planetarium LEGO Robotics Program, which included one teacher and several students. WSGC also funded the high school team that won the Wyoming FIRST Tech Challenge competition in Casper, WY so they could participate in the International FIRST Tech Challenge in St. Louis, MO. The team included 2 teachers and 8 students. We also supported a local FIRST Lego League team from Laramie to participate in the national competition at LEGOLAND. The team included 1 coach and 6 team members. Teacher Education Resources covers teacher workshops, Space Trunks, and funded events. WSCG supports the Wyoming Science Teacher Association annual meeting, where we publicize educational resources available from WSGC and NASA. The Space Trunks contain educational materials available to teachers around the state. We currently have two trunks: Rockets and Telescopes. These trunks are very popular and sent out on a regular basis. In addition, we accept proposals from schools and teachers for educational events and workshop attendance. We were able to fund several events this year, including: 1) Scholarships for teachers enrolled in the new M.S. in Teaching in Astronomy online program through the University of Wyoming – 14 scholarships were awarded, 2) Astro-Science Camp near the Wind River Reservation, 3) Cardio Talk for Sci Fri in Sheridan, WY, 4) STEMtech online conference participation for a teacher in Rock Springs, WY, 5) UW Planetarium show for a teacher and students from Indian Paintbrush School in Laramie, WY, 6) Pre-service teacher workshop at UW with a NASA AES, 7) Funding for a teacher to attend the 2011 NASA AREES workshop, 8) Funding for the regional science fair in collaboration with the Casper Planetarium, and 9) 2011 Summer of Innovation Science Camp in Laramie. Space Grant collaborates with the NASA Educator Resource Center, located at the University of Wyoming. The ERC has a large collection of books, videos, posters, and lesson plans available for loan to teachers. In 2010, the ERC cataloged all of the NASA materials and added them to the UW library system. WSGC contributed funding to update many of the materials in 2010.

Did your consortium use FY2010 Space Grant resources in support of the following (check all that apply): Activity Exclusively Targeted toward Middle School Educators, Activity Exclusively Targeted toward Middle School Students, Activity in support of NASA Summer of Innovation

Please provide a brief description of any project or activity that exclusively targeted middle school educators, middle school students, and/or was in support of the NASA Summer of Innovation (using FY2010 Space Grant resources). Enter N/A if not applicable to your consortium.

During FY2010, WSGC supported several programs that were directed specifically at middle school aged students and/or teachers. WSGC provided funding to the Casper Planetarium for the state FIRST Lego League competition that was held in Casper, WY. WSGC also sponsored the FIRST Lego team that won the state competition and supported them in their travel to the national competition at LEGOLAND. Additionally, WSGC supports the Exxon Mobile Bernard Harris Summer Science Camp – Wyoming Astrocamp by providing stipends for teachers in the program in addition to administrative support for camp directors, teachers, and participants. Astrocamp is directed at students in 6-8th grade. For the past two years, Dr. Shawna McBride, the Associate Director for the Wyoming NASA Space Grant program has traveled to Sheridan, WY to present talks and hands-on experiments for students in the Sheridan County School

District “Sci Fri” program. The program is directed at middle school students in gifted and talented programs throughout the county. The program is held at Sheridan College and students travel from Sheridan, Big Horn, and Ranchester, WY to attend “Sci Fri”. In FY2009, Dr. McBride did brain dissections with the students and talked about her research in neuroscience. In FY2010, Dr. McBride dissected hearts, hooked students up to EKGs, and talked about her research in cardiovascular traumas. Approximately 40 students and three teachers attend “Sci Fri”. In FY2010, WSGC sponsored a trip to the UW Planetarium for a 6th grade teacher and her class from Indian Paintbrush School. Additionally, WSGC supported the Astro-Science Camp near the Wind River Reservation for students aged 12-15. Several of the traveling Space Trunks available through Space Grant were also checked out by middle school teachers for use in their classrooms (12 visits to middle school classrooms in FY2010). Finally, WSGC invited Tony Leavitt, a NASA AES, to the University of Wyoming in the Fall of 2010 for a workshop for pre-service teachers in the Science and Math Teaching Center. Tony worked with two groups – 1) secondary science educators and 2) elementary and middle school educators. Wyoming was one of four states chosen for the 2010 Summer of Innovation program. WSGC would like to continue this program in the state by providing teacher workshops and summer science camps for students and teachers throughout Wyoming. In the summer of 2011 (FY2010), WSGC helped put on a teacher workshop at the University of Wyoming for STEM teachers throughout the state. This was a three-day workshop, with presentations from NASA Education Specialists (Tony Leavitt and Miranda Martin). Funding for this program was provided through the original 2010 Summer of Innovation grant. WSGC supported a smaller summer science camp similar to the 2010 Summer of Innovation camp in Laramie with Space Grant funding. Thirteen students in 6-9th grades attended the week-long camp and funding was used for teacher stipends for two teachers. Afterschool partners from summer 2010 provided the supplies for the camp (Big Brothers Big Sisters in Laramie, WY and the Laramie County Community Partnership in Cheyenne, WY). We hope to build this program and continue it in the future. WSGC has submitted an i3 Investing in Innovation grant to the Department of Education in collaboration with the Laramie County Community Partnership, in the hopes of building the program and providing opportunities for teachers and students throughout the state.

Precollege Activity Data

Total Number of Professional Development Workshops for Teachers (Short Duration, less than 2 days in length): 2
Total Number of Professional Development Workshops for Teachers (Long Duration, greater than or equal to 2 days in length): 5
Total Number of Student-based Projects Supported by Space Grant (Short Duration, less than 2 days in length): 4
Total Number of Student-based Projects Supported by Space Grant (Long Duration, greater than or equal to 2 days in length): 6

DIRECT Precollege participants

Direct Participants - In-service Educators: 85
Direct Participants – Pre-service Educators: 58
Direct Participants - Informal Educators/Museum Staff: 5

Direct Participants - Precollege Students: 746
Direct Participants – Administrators: 1
Direct Participants - Parents/Guardians: 1
Direct Participants - Higher Education Students (non- Pre-service): 49
Direct Participants - Higher Education Faculty: 15
Direct Participants - Public At Large: 0
Direct Participants - Other Adult: 17
Direct Participants - Other: 0

Total Direct Participants: 977

A description of "Other Participants" if applicable:
Other participants include presenters, volunteers, and keynote speaker for Women in Science, not associated with the university (professional women).

Higher Education Students involvement with Faculty in the conduct of Precollege projects:

Several University of Wyoming students and faculty members volunteer to help with Women in Science, AstroCamp, and State Science Fair judging. Many are also previous recipients of Space Grant awards.

Are evaluation mechanisms in place which demonstrates that student-based project(s) quantitatively contribute to the STEM pipeline?

Yes

It is difficult to quantitatively track precollege students involved in student-based projects. For events such as Women in Science, AstroCamp, and Science Fair, feedback is solicited from students following the event addressing questions regarding whether they intend to pursue STEM careers. We also receive anecdotal evidence from time to time that reassures us that these programs are successful in directing budding scientists into STEM fields. On our fellowship and scholarship applications we also ask whether students have been involved in any of our precollege programs, which often they have been. Hopefully, all of these programs increase awareness and enthusiasm for science, technology, engineering, and mathematics and educate and excite precollege students about the opportunities available in the sciences.

Are evaluation mechanisms in place which demonstrates that teachers utilize the Space Grant-supported materials/knowledge/experience in their classrooms?

Yes

For programs such as Women in Science, AstroCamp, and Science Fair, feedback is solicited from teachers following the event to assess and refine the program and evaluate the impact. For programs such as Robotics, Teacher Education Resources, and the Educator Resource Center evaluation is based upon use of resources by teachers, workshop attendance, and funded event reports returned after an event. Use of resources has increased consistently, indicating success.

Comparison of FY2009 Performance Data Report to FY2010 Submission:

Expenditure Summary: The expenditures in FY2010 are slightly higher than in FY2009. The increase is mainly attributable to a higher overall budget in FY2010 compared to FY2009. Additionally, WSGC sponsored a Summer of Innovation science camp, providing teacher stipends in FY2010. In FY2009, this camp was supported by the 2010 Summer of Innovation funding and no Space Grant funds were expended. We also increased support for Robotics programs and provided funding to the NASA ERC to update materials in FY2010. In FY2010, the amount of money contributed from sponsors for Women in Science decreased due to the economy, so Space Grant contributed more than normal to that project. Administrative expenses related to EMBHSSC-Astrocamp increased slightly due to the increase in the number of participants. Number of Projects: The number of projects has decreased by one as we are no longer supporting an Explorer School. Participants: The number of participants has slightly increased in FY2010 compared to FY2009. The increase in teacher and pre-service teacher participants from 2009 to 2010 is due to providing workshops for pre-service teachers with Tony Leavitt, the NASA AES, and providing scholarships to teachers enrolled in the M.S. in Teaching in Astronomy program through the SMTC. The increase in the number of student participants is due to a record number of participants in the Women in Science conference this year. Numbers for all other participants are similar. Professional Development Workshops for Teachers: The number of long duration workshops has gone from 1 in FY2009 to 5 in FY2010. This is due to efforts to work with the NASA AES to provide workshops for teachers and our efforts to work with the SMTC to provide scholarships for teachers pursuing their M.S. degree. Student-based Projects: The number of student-based projects has increased slightly. This is mainly due to continuation of the Summer of Innovation program in summer 2011 and increased support of robotics programs in the state. Evaluation Strategy: This is the same.

Informal Education Performance Data Summary

Total number projects: 1
Total number of affiliates involved in projects: 1
Total number of non-affiliate organizations involved in projects: 1

Affiliate Members Participating

Casper Planetarium

Non-affiliate organizations participating:

Fremont County Public Library

General Description of Informal Education Projects

In the Informal Education category we have included the following projects: 1) Museum/Library/Planetarium Outreach. Museum/Library/Planetarium Outreach is designed to provide informal educational opportunities to the state. Museums, libraries, and planetariums can request funding for exhibits, special programs, printing of educational materials, etc. Informal education proposals are evaluated by conformance to the NASA guidelines for informal

education. The population of Wyoming is widely dispersed and informal education resources greatly benefit the state. In 2010, Space Grant provided funding for two programs: 1) a technology update for the Casper Planetarium – an iPad which allows them to control the equipment anywhere in the planetarium, not just behind the podium, and 2) a telescope was purchased for the Fremont County Public Library to start a telescope lending and night sky viewing program. Both programs are headed by staff that engage the public and facilitate learning. Both programs also offer educational materials associated with the programs.

DIRECT Informal Education Participants:

Total Number of Professional Development Workshops for Informal Educators (Short Duration, less than 2 days in length): 0
Total Number of Professional Development Workshops for Informal Educators (Long Duration, greater than or equal to 2 days in length): 0
Total Number of Exhibits Supported/Developed using Space Grant funds: 0
Total Number of "Student Hands-On Activities" Supported: 0
Total Number of "Public at Large" Activities Supported: 2

Direct Participants – In-service Educators: 0
Direct Participants – Pre-service Educators: 0
Direct Participants - Informal Educators/Museum Staff: 1
Direct Participants - Precollege Students: 0
Direct Participants – Administrators: 0
Direct Participants - Parents/Guardians: 0
Direct Participants - Higher Education Students (non- Pre-service): 0
Direct Participants - Higher Education Faculty: 0
Direct Participants - Public At Large: 0
Direct Participants - Other Adult: 1
Direct Participants - Other: 0

Total Direct Participants: 2

A description of "Other Participants" if applicable:
Director of the Telescope Lending - Night Sky Viewing program at the Fremont County Public Library

Higher Education Students involvement with Faculty in the conduct of Informal Education projects:
N/A

Comparison of FY2009 Performance Data Report to FY2010 Submission:
Expenditure Summary: The amount spent on informal education substantially decreased from FY2009 to FY2010. In FY2009 several of the projects under this category, the website, newsletter, and Star Date, had considerable administrative costs associated with them. We are no longer supporting those projects. Additionally, we expended more funding on museum outreach in 2009 as compared to 2010. Number of Projects: WSGC is only supporting one

project under Informal Education, Museum/Library/Planetarium Outreach, in FY2010 compared to four in FY2009. The number of participants, professional development workshops, student hands-on activities, and evaluation strategies are similar. Public at large activities have increased from 0 in 2009 to 2 in 2010.

FY2010 Space Grant Performance Data
Expenditure Summary

Wyoming NASA Space Grant Consortium

Summary of FY10 Expenditure by Project Category

	Fellowship	Research Infrastructure	Higher Education	Precollege	Informal Education	*Consortium Admin Costs	Indirect Costs	Total
NASA Space Grant	$ 301,611	$ 139,136	$ 81,087	$ 51,302	$ 710	$ 86,154	$ -	$660,000
Lead Institution	$ 82,984	$ 61,497	$ 9,095	$ 4,300	$ -	$ 22,500	$ 330,000	$510,376
Academic Affiliates	$ -	$ -	$ -	$ -	$ -	$ 15,275	$ -	$15,275
State/Local Government	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$0
Non-profit	$ -	$ -	$ -	$ 100	$ -	$ 5,324	$ -	$5,424
Industry	$ -	$ -	$ -	$ 230	$ -	$ -	$ -	$230
Other non-federal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$0
	Fellowship	**Research Infrastructure**	**Higher Education**	**Precollege**	**Informal Education**	***Consortium Admin Costs**	**Indirect Costs**	**Total**
TOTAL:	**$384,595**	**$200,633**	**$90,182**	**$55,932**	**$710**	**$129,253**	**$330,000**	**$1,191,305**

* Consortium management and/or administration that is not attributable to a specific project(s).

Distribution of Funds across Programmatic Elements (Total Funds Available)

* Consortium management and/or administration that is not attributable to a specific project(s)

Table A.1.

TABLE A.1. All Direct Student Participant Demographics				Wyoming NASA Space Grant Consortium		
FY2010 Student Participant Summary	Number of Students	Number of Female Students	Number of Male Students	Number of Underrepresented Minority Students	Number of Undergraduate Students	Number of Graduate Students (Masters and PhD)
Fellowship/ Scholarship	90	39	51	10	82	8
Higher Education	9	3	6	1	7	2
Research Infrastructure	284	95	140	26	279	5
Total Students	383	***137***	***197***	***37***	***368***	***15***
Calculates Automatically Total Direct Participants		*Total for both columns = Total Direct Participants*		*Subset of Total Direct Participants*	*Total for both columns = Total Direct Participants*	

Summary Data (Calculates Automatically)	Total Total Direct Participants	Percentage of Female Student Participants	Percentage of Male Student Participants	Percentage of Underrepresented Minority Student Participants
	383	41.0%	59.0%	11.1%

FY2010 Student Participant Gender (Unknown/Unreported)	Participants for whom gender are not known/reported
Fellowship/Scholarship	0
Higher Education	0
Research Infrastructure	49
Total Unknown (A Subset of Total Direct Student Participants)	49

Note: Large numbers in this table will be cause for concern.

Instruction: Enter the Total Number of Students in the Yellow Column for the Fellowship/Scholarship, Higher Education and Research Infrastructure rows. For each row, enter the number of female and male students (if the number of male plus female students does not equal the number in the yellow column for the corresponding row, the fields will show as red; the delta will be displayed in the grey table of unknown/unreported).

For each row, enter the number of underrepresented minority students as a subset of the number in the yellow column for the row (if the number of underrepresented minority students is greater than the number in the yellow column for the row, the field will show as red).

For each row, enter the number of Undergraduate and Graduate Students (if the number of Undergraduate plus Graduate students does not equal the number in the yellow column for the corresponding row, the fields will show as red).

*****The data in the above table should be inclusive of ALL DIRECT STUDENT PARTICIPANTS (funded and unfunded) in the Fellowship/Scholarship, Higher Education and Research Infrastructure programs, consortium-wide.***

Table A.2.

TABLE A.2. ALL DIRECT Funded Students (Subset of Direct Participants in A.1) | **Wyoming NASA Space Grant Consortium**

FY2010 Student Award Summary	Number of Students	Number of Awards to Female Students	Number of Awards to Male Students	Number of Awards to Underrepresented Minority Students	Number of Undergraduate Awards	Number of Graduate Awards (Masters and PhD)
Fellowship/ Scholarship	82	37	45	10	74	8
Higher Education	1	1	0	0	0	1
Research Infrastructure	16	7	9	0	11	5
Total Awards	99	***45***	***54***	***10***	***85***	***14***
Calculates Automatically Total Funded Students		*Total for both columns = Total Funded Students*		*Subset of Total Funded Students*	*Total for both columns = Total Funded Students*	

Summary Data (Calculates Automatically)	Total Number of Awards	Percentage of Awards to Female Students	Percentage of Awards to Male Students	Percentage of Awards to Underrepresented Minority Students
	99	45.5%	54.5%	10.1%

*****The data in the above table should be inclusive of ALL MONETARY STUDENT AWARDS (regardless of amount) in the Fellowship/Scholarship, Higher Education and Research Infrastructure programs, consortium-wide.***

Instruction: *Enter the Total Number of Students in the Yellow Column for the Fellowship/Scholarship, Higher Education and Research Infrastructure rows. For each row, enter the number of female and male students (if the number of male plus female students does not equal the number in the yellow column for the corresponding row, the fields will show as red).*

For each row, enter the number of underrepresented minority students as a subset of the number in the yellow column for the row (if the number of underrepresented minority students is greater than the number in the yellow column for the row, the field will show as red).

For each row, enter the number of Undergraduate and Graduate Students (if the number of Undergraduate plus Graduate students does not equal the number in the yellow column for the corresponding row, the fields will show as red).

Table A.3.

TABLE A.3. ALL DIRECT FUNDED STUDENTS BY INSTITUTION

Wyoming NASA Space Grant Consortium

FY2010 Student Awards by Institution	Number of Students Funded	Minority Serving Institution
Lead Institution - University of Wyoming	44	
Univ. of WY-Winston-Salem Partnership	2	X
Casper College	7	
Central Wyoming College	4	
Eastern Wyoming College	9	
Laramie County Community College	18	
Northern WY Community College District	9	
Western Wyoming Community College	6	
Total Student Awards (This number MUST be equal to the TOTAL NUMBER of AWARDS in A.2)	99	

INSTRUCTION: *Add rows to table above to accommodate all affiliates and non-affiliates where students were awarded direct funding support. Enter the number of student awards for each institution. Indicate with a check mark any affiliates that are minority serving institutions (Hispanic Serving Institutions, Tribal Colleges and Universities, Historically Black Colleges and Universities, and Other Minority Institutions).If the Total Student Award figure in Table A3 is not equal to the Total Student Award Figure in Table A2, the field will be red. The discrepancy must be resolved*

Table B.

TABLE B. LONGITUDINAL TRACKING					Wyoming NASA Space Grant Consortium						
FY 2010 LONGITUDINAL SUMMARY		STATUS - ENROLLED		NEXT STEP STEM EDUCATION	NEXT STEP STEM EMPLOYMENT						NEXT STEP NON-STEM OTHER
For all students who received a "significant" award in Fellowships/Scholarships, Higher Education and Research Infrastructure	Number of Significant Awards in FY2010	Still Enrolled In Current Degree Program FY2006 -FY2009	Still Enrolled In Current Degree Program FY2010	Graduated and Pursuing Advanced STEM Degree	Graduated and seeking STEM Employment	Employed in STEM (Aerospace Contractor)	Employed in STEM (non-aerospace) Position	Employed by NASA/JPL	Employed in K-12 STEM Academic Field	Employed in "Other" STEM Academic Field	All Other (e.g. non-STEM employment, non-STEM academic degree)
Fellowship/Scholarship											
Number of Students	**37**	**23**	**24**	**37**	**4**	**5**	**29**	**0**	**1**	**7**	**5**
Number Underrepresented	6	5	4	4	1	0	1	0	1	0	0
Number Male	24	15	16	27	3	2	24	0	0	4	2
Number Female	13	8	8	10	1	3	5	0	1	3	3
Number of Undergraduate	29	15	21	0	1	1	22	0	1	1	5
Number of Graduate (Masters/PhD)	8	8	3	37	3	4	7	0	0	6	0
Higher Education and Research Infrastructure											
Number of Students	**8**	**0**	**3**	**7**	**2**	**0**	**4**	**0**	**0**	**0**	**0**
Number Underrepresented	1	0	0	1	1	0	1	0	0	0	0
Number Male	6	0	3	5	1	0	3	0	0	0	0
Number Female	2	0	0	2	1	0	1	0	0	0	0
Number of Undergraduate	7	0	2	0	2	0	3	0	0	0	0
Number of Graduate (Masters/PhD)	1	0	1	7	0	0	1	0	0	0	0

***Summary Data**	Number of Significant Awards in FY2010	Still Enrolled FY2006-FY2009	Still Enrolled FY2010	Pursuing Advanced STEM	Seeking STEM Employment	Employed STEM Aerospace Contractor	Employed STEM non-Aero Position	Employed NASA JPL	Employed in K-12 STEM Academia	Employed "Other" STEM Academia	ALL NON-STEM NEXT STEP
Total Awards	45	23	27	44	6	5	33	0	1	7	5
Total Underrepresented	7	5	4	5	2	0	2	0	1	0	0
Total Male	30	15	19	32	4	2	27	0	0	4	2
Total Female	15	8	8	12	2	3	6	0	1	3	3
Percent Underrepresented	15.6%	21.7%	14.8%	11.4%	33.3%	0.0%	6.1%	#DIV/0!	100.0%	0.0%	0.0%
Percent Male	66.7%	65.2%	70.4%	72.7%	66.7%	40.0%	81.8%	#DIV/0!	0.0%	57.1%	40.0%
Percent Female	33.3%	34.8%	29.6%	27.3%	33.3%	60.0%	18.2%	#DIV/0!	100.0%	42.9%	60.0%

Calculates Automatically - Subset of Participants in A1.