

# Program Performance and Results Report Probation Improvement Plan

## South Dakota Space Grant Consortium

Submitted to:

NASA Headquarters

Submitted by:

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## Self-analysis of PPR Results

The SD Space Grant Consortium acknowledges the following problem areas identified in the PPR Report and commits to making the necessary improvements that are explained in the Improvement Plan section through our objectives and metrics.

### A) Fellowship and scholarship (F/S) Program

We acknowledge that although our fellowships have consistently been awarded to a diverse group of high-achieving students at our member universities, the F/S program has followed somewhat of an informal process that needs to be formalized. Table 1 outlines the key elements of the former vs. the new F/S program. Please refer to the Improvement Plan section of this report for an explanation of the key elements of the new program, as well as to the attached SDSGC **Strategic Plan** (dated Dec. 20, 2004) which contains detailed goals, objectives, strategies, and outcome indicators for achieving the new F/S Program.

**Table 1.**

<b>SDSGC Fellowship/Scholarship Program</b>	
<b>Key Elements - Former Program</b>	<b>Key Elements - New Program</b>
Semi-formal to informal process of announcing, reviewing, selecting, and assessing F/S applications and awards. <ul style="list-style-type: none"> <li>➤ Some institutions use individualized application process</li> <li>➤ Ad hoc committee review, when necessary</li> <li>➤ Selections made on faculty or ad hoc committee recommendations</li> <li>➤ Student deliverables (project publication, report, outreach) encouraged, but not required</li> <li>➤ Little student tracking after award expires or student graduates</li> </ul>	Formalized process of announcing, reviewing, selecting, and assessing F/S applications & awards. <ul style="list-style-type: none"> <li>➤ Unified criteria, approved by SDSGC Management Team, used by all Consortium institutions</li> <li>➤ Applications reviewed and award selections made by formal Campus Review Committee consisting of Space Grant and faculty membership</li> <li>➤ Applicants submit individualized goals, objectives, and outreach plan for their project</li> <li>➤ All fellows must complete two hours of professional development per month</li> <li>➤ Exit interview questionnaire with a Likert Scale rating experience.</li> </ul>
F/S awards only to 3 institutional member universities (SDSM&T, SDSU, and Augustana).	One or two additional F/S award(s) to affiliate universities selected by SGS GC Management Team.
Basic F/S data is reported, but doesn't emphasize diversity.	F/S reported in relation to external benchmarks (enrollment and census statistics)
	Establish and integrate an "oversight" team member to ensure institutions follow the core fellowship process and maintain the minimum standards.

### B) Strategic Planning

SDSGC has operated its programs quite successfully during the past 5 years, but has never developed a Strategic Plan to guide our programs and provide a logical basis for assessing program success. Additionally, we have not provided a discussion or analysis of State needs or a strategic plan to meet them. Note: A Dec. 20, 2004 draft Strategic Plan was developed through Consortia-wide input during the Fall of 2004, and is attached here.

### C) Overall Program Evaluation

Until now, the SDSGC Management Team at the Consortium's quarterly meetings has conducted limited program evaluation. SDSGC's PPR had insufficient documentation of objectives, goals, metrics, and program assessment and evaluation approaches in several program areas. While we feel our consortium has held many productive activities over the past five years, we have not defined their relationship to objectives, nor have we clearly reported how success is gauged in measurable terms. Likewise, we have not had an outside advisory entity provide suggestions to our SDSGC Management Team, such as the Technical Advisory Committee (TAC) to the SD NASA EPSCoR Program. As explained later in the Improvement Plan section, with 1) the development of a Strategic Plan that will be regularly assessed and updated, and 2) input from the TAC, we will significantly improve our ability to evaluate the Consortium's performance. (See External Program Evaluator description in Strategic Plan section 1.9).

The SDSGC Management Team has already begun implementing the corrective actions described in the remainder of this improvement plan to address the identified problem areas. We will continue to do so in the future to assure that the appropriate improvements are maintained and that the effectiveness and impact of the SD Space Grant

Consortium is maximized. The SDSGC Management Team currently consists of the following representatives from the four institutional members: 1) SDSGC Director Dr. Edward Duke of SDSM&T, 2) Deputy Director & Outreach Coordinator Mr. Tom Durkin of SDSM&T, 3) Manager of Special Projects for NASA Workforce Development Dr. Jacquelyn Bolman of SDSM&T, 4) Associate Director Mr. Kevin Dalsted of SDSU, 5) Associate Director Dr. Daniel Swets of Augustana College, and 6) Science Dept. Manager Mr. Gregg Johnson of the USGS EROS Data Center. Beginning in 2005, two new rotating positions on the Management Team, for a period of two years each, will be filled by affiliate member representatives.

#### **D) Consortium Operations and Recruitment of Underrepresented Minorities**

The lack of discussion in SDSGC's PPR report on the Consortium's strategy to recruit underrepresented minorities and women was identified as a weakness. Affiliate participation in the decision-making process, particularly regarding funding, must be improved. SDSGC has not had a policy for adding or dropping affiliates. We recognize that the relationship with our affiliates has been relatively informal and without documentation of roles and mutual expectations. (See Strategic Plan sections 1.3, 2.1, 2.2, 3.2, 5.1, 6.1, 6.2, and 6.3).

##### **Building on Current Strengths and Recent Accomplishments**

We offer the following self-analysis of SDSGC's past and recent efforts in building linkages with Tribal Colleges and recruiting Native American students, with specific accomplishments at SDSM&T and SDSU as examples.

Dr. Jacquelyn Bolman was hired in September 2004 as SDSGC's Special Projects Manager for NASA Workforce Development. Dr. Bolman came to SDSGC Headquarters from SDSM&T's Office of Multicultural Affairs with an outstanding expertise in Native American student recruitment and retention. The ability of SDSGC to successfully report our accomplishments at educating and graduating Native American students within SMET fields has recently been, and will continue to be, significantly improved as a result of this addition to our Headquarters staff.

SDSM&T has made considerable advances in recruiting and retaining underrepresented students during the past four years, successfully placing the institution as a national leader in this area. According to the Mission Statement of SDSM&T's Office of Multicultural Affairs, SDSM&T will achieve and maintain national prominence for the recruitment, retention and graduation of American Indians seeking mathematics, science, and engineering at the graduate and undergraduate levels. From 1970 to 2000, SDSM&T graduated 40 American Indians in SMET degree programs. Since 2000, the institution has graduated 19 American Indians with engineering and science degrees. As of the Fall 2004 semester, SDSM&T has 84 American Indian students (a record number) pursuing engineering and science degrees, with 18 at senior-level status. In Spring 2003, there were only 315 American Indian graduates nationwide in SMET fields. SDSM&T graduated a total of 7 students in these fields, the highest number of American Indian graduates from any one institution. In May 2004, 9 Native American students (3 graduate and 6 undergraduate students) graduated from SDSM&T, including SDSM&T's first American Indian Ph.D. recipient. This summer (2004), SDSM&T has two American Indian NASA Workforce Development students (James Sanovia and Jenny Stover) completing internships at Goddard Space Flight Center. Space Grant fellowships provide much needed support for many of these Native American students. These accomplishments and statistics are testimony to the value of Space Grant to Native American student recruitment and retention.

SDSM&T is currently updating articulation agreements with Oglala Lakota College, United Tribes Technical College in ND, and Sinte Gleska University. This is a significant step in providing a process where Tribal College students can supplement their program of study with university courses. SDSM&T has one of the strongest American Indian Science and Engineering Society (AISES) Chapters in Region V (Canada, Iowa, Illinois, Upper Michigan, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin). SDSM&T currently has 40 AISES members, and membership increases each year. The SDSM&T AISES chapter held the largest Regional Conference in AISES history in April 2004 with 170 students attending from seven states. AISES students have competed in oral and poster research competitions with seven students competing at the 2003 AISES National Conference. Louie Arguello (a member of the KC-135 NASA Reduced Gravity Student Flight Opportunity Program in March 2000) received a top prize in the 2003 National AISES research competition.

Consortium affiliate Oglala Lakota College (OLC) and SDSM&T recently completed the second summer of the NSF "Bridges to Success" Research Program. This is a collaborative partnership where approximately seven undergraduate students from each college participate in a 12 week residential research experience. Students were partnered with faculty researchers and mentors in various research projects. The goal of the project is to increase American Indian student research achievement and success as well as assist in bridging students into the university system. The project has been very successful with a retention rate of 100%. In Fall 2004, approximately 4 of the 7 Oglala Lakota College students will attend SDSM&T. SDSGC's Workforce Development Program staff provided mentoring, advisement, and NASA information.

This summer, SDSM&T also co-hosted the Oglala Lakota College Honors Program that provided 125 American Indian high school students a 6-week summer academic enrichment program. Space Grant staff interacted with the students on a number of activities and provided information and encouragement for their pursuit of NASA opportunities.

Similar to these accomplishments, South Dakota State University (SDSU) provides the SDSU / Flandreau Indian School “Success Academy”, an early and intensive college preparatory program for American Indian freshmen through senior level high school students. Success Academy exposes students not only to college, but also to careers open to college graduates. The program emphasizes career areas that have been identified by Tribal leaders as representing critical needs in their communities (e.g., engineering, agriculture, education, pharmacy and nutrition). Success Academy students complete a number of visits to the SDSU campus and receive “hands on” workshops in all seven of SDSU’s academic colleges (engineering, pharmacy, nursing, arts and science, education and counseling, family and consumer sciences, and agriculture and biological sciences).

SDSU works with the junior and senior students at Flandreau Indian School by providing these junior level students and their parents with day-long sessions at SDSU. Sessions include how to prepare for college, admissions processes, financial aid, and choosing a field of study. The program allows students and their parents to become closely acquainted with the college administration and support staff. The students are able to establish an important mentoring relationship with a faculty and/or university representative. The Success Academy provides a significant contribution to the American Indian community.

#### Recruiting Women in Science and Engineering

With regard to the identified lack of discussion in SDSGC’s PPR report on the Consortium’s strategy to recruit women, in addition to our continued intent to recruit female student fellows, it is noteworthy to mention the Consortium’s continued intent to support the five “Women in Science” (WIS) Conferences held throughout the state. We believe that the WIS Conferences help contribute to our strategy to recruit underrepresented minorities and women. For the past three years, one conference has been held in Aberdeen, SD. The 2004 conference expanded to include four towns. Over 800 girls from grades 6-12 attended the 2004 WIS Conferences. In 2005, WIS Conferences may be further expanded to include six towns across the state. These conferences expose girls to the endless opportunities in science-related careers and are part of SDSGC’s strategy for recruiting and training women for careers in science and technology.

#### SDSGC’s Focus in Earth System Science

Because SDSGC’s focus on Earth System Science was brought into question in the PPR review comments, it is prudent to explain several of the main reasons why the Consortium has chosen to focus on Earth Science as a specific, but not sole, area of emphasis. The USGS EROS Data Center is host to the world’s largest civilian archive of remotely sensed land data and is located in Sioux Falls, SD. EROS hosts the NASA Land Processes Distributed Active Archive Center. EROS has remained a very active institutional member of the Consortium since the Consortium’s inception in 1991 and is a key factor to our success. Collaborative projects between EROS scientists and other Consortium personnel complement the Consortium’s research and educational efforts in remote sensing, satellite imagery, GIS, global and regional geoscience, environmental science, and K-12 educational outreach. Furthermore, South Dakota is largely an agricultural state. By leveraging our State’s Earth Science resources, we meet many of our State needs.

Among EROS’s missions is the promotion of new uses, new users, and new understanding of land information, so that others can better understand our planet. While many EROS programs are nationally and globally focused, SDSGC provides an important communication forum for Earth remote sensing topics in the state and then relates the EROS mission to the state and university population. EROS also ensures that scientists, researchers, businesses, decision makers, and the public have ready access to the land-related information they need. SDSGC provides a convenient vehicle by which state and regional users, scientists, and researchers can: 1) become educated on the availability of Earth resources data, and 2) provide feedback on information and data requirements to EROS.

Having a strong focus on Earth Science within the Consortium aligns with NASA’s mission to understand and protect our home planet by using our view from space to study the Earth system and improve prediction of changes in the Earth system. Having a Consortium-wide focus on Earth System Science assists NASA in creating technology and knowledge that is used to enhance economic security and environmental stewardship.

## Improvement Plan

### Specific actions to solve identified problems

(See attached 12/20/04 Strategic Plan for detailed Goals, Objectives, Strategies and Outcome Indicators)

#### A) Fellowship and Scholarship (F/S) Program

##### **Objectives:**

- *Formalize process of announcing, reviewing, selecting, and assessing fellowships and scholarships.*
- *Increase and sustain SDSGC's funding of fellowships awarded to women and minority students.*
- *Develop an American Indian transfer scholarship program that provides at least one transfer scholarship to be awarded each year to a South Dakota Tribal College student to complete a four-year degree program at an SDSGC affiliate university.*

**Timeline:** *Approval of Formalized F/S Procedure at October 2004 Quarterly Meeting*

##### **Metrics:**

- *Development of criteria (set of standards) to formalize the process which will be outlined on the Consortium website and followed by all Consortium members.*
- *Increase number of Consortium academic institutions receiving F/S awards by one.*
- *Awards equal or exceed 20% to minorities and 50% to women.*
- *Development and distribution of a "fellowship handbook".*

#### Description of Key Elements of New F/S Program, as outlined in Table 1

As a requirement of the SDSGC's improved F/S program, all SDSGC institutional member universities will now institute a formalized process of announcing competitive Space Grant F/S opportunities and implement a competitive selection process. In addition to continuing our practice of informing campus faculty and maintaining a verbal awareness of Space Grant F/S opportunities, each campus will issue a campus-wide "Call for F/S Proposals" to students and faculty. A campus Space Grant fellowship review committee consisting of the Space Grant contact and two faculty members will review received proposals. The campus review committee will make recommendations to the SDSGC Management Team regarding selections. Award selections will be made competitively based on student academic performance, program of study, academic achievement, the student's indication of how the F/S funds would be used, and alignment of the student's research project or course of study to SDSGC objectives.

In addition to the three SDSGC institutional member university's Call for F/S Proposals described above, a "Consortium-wide" Call for F/S Proposals will also be made. This will allow additional F/S awards to be made to SDSGC affiliate colleges and universities each year. For more a more detailed description, see Strategic Plan section 2.1, 2.2).

The South Dakota Space Grant institutions will develop a statewide comprehensive listing of all NASA student fellows. Fellows will each prepare a set of objectives and goals for their project and/or research, to include an individualized outreach plan. This will be helpful in identifying campus resources, faculty, and support programming to increase collaborations and fellow success. Fellows will be required to participate in two hours of professional development each month, to include training on presentation skills, research poster and presentation development, professional writing, and development and submission of research article with a faculty mentor/researcher. As conference opportunities and each student's schedule allows, the students will also be encouraged to present their research and/or presentation at NSF and NASA EPSCoR conferences and meetings, South Dakota Space Grant Student Fellow Summit, South Dakota Academy of Science, and other professional associations and conferences. Fellows will also conduct at least one NASA educational or research related presentation each semester to a K-12 or community group. This process builds the outreach skills of fellows and also brings the K-12 and larger community into a greater understanding of NASA and South Dakota Space Grant. This will further build and strengthen our Consortium network and NASA workforce pipeline.

During the Fall 2004 semester, a "SD Space Grant Student Fellow Summit" will provide an opportunity for all SDSGC student fellows to present their accomplishments in NASA-related research and education that have been supported through Space Grant. Faculty, SDSGC industrial affiliates, and middle/high school teachers will be invited to see what Space Grant students can accomplish.

The Space Grant Headquarters Office staff will prepare an exit interview questionnaire for student fellows. The questionnaire will be a combination of questions highlighting the student's achievement of fellowship objectives as well as recommendations/suggestions to strengthen the fellowship process. The Space Grant staff will interview fellows and record their responses to the exit interview questions. Fellows will have an established set of objectives and goals to be met by the end of their fellowships. Space Grant staff will also review fellow progress including but

not limited to: increase in GPA, number of poster and oral research presentations at local and professional conferences, and their involvement in conferences and scientific meetings.

Student Fellows at State institutions will be tracked and monitored via “Colleague”, the state’s education database. This database will also track GPA, ACT, SAT, Sophomore Proficiency Tests, etc. It is also possible to track students through internships, coops and job placements.

Honing SDSGC’s F/S Program in this manner will result in providing better qualified students to the NASA workforce pipeline. Our student fellows will help provide the required disciplines and professional capabilities that NASA will need as up to 25% of the agency’s current workforce becomes eligible to retire over the next three years.

## **B) Strategic Planning**

### ***Objectives:***

- *Establish and test a Strategic Plan including a vision and mission.*
- *Establish an understanding of critical needs of South Dakota and SDSGC to ensure student fellows and faculty researchers develop projects with “Problem Solving Relevance” and student fellows are allowed an option where they experience the application of their work.*
- *Explore opportunities where SDSGC Strategic Plan, goals and objectives meet State needs as identified in the Governor’s 2010 Initiative.*
  - \* *Develop collaborations that are “inclusive” of state programs and activities*
  - \* *Network/coordinate related meetings/activities and invite participation from State personnel.*
  - \* *Position SDSGC to provide input into the review and evaluation of the Governor’s 2010 plan.*
  - \* *Develop and host an annual “Space Grant Capital Day” in Pierre where SDSGC representatives provide an update to the Governor and Legislators on programming.*

***Timeline:*** *Draft initialized by October 2004, input provided by SDSGC affiliates during fall and winter 2004/2005, reviewed by NASA, and finalized in spring 2005.*

### ***Metrics:***

- *A Strategic Plan completed and testing initiated during probationary period.*
- *Documented collaboration with all members and affiliates.*
- *All 7 Space Grant program areas are included in Strategic Plan.*
- *Assess and annually update Strategic Plan.*
- *One proposal submitted by the SDSGC to an outside funding agency to further develop and support programming and activities.*

Along with the 15 year milestone of the Space Grant Program comes the transition of a new director to the SDSGC. The previous Director, Dr. Sherry Farwell, has moved to the NSF EPSCoR program in Washington. The launch of a new Space Grant performance cycle provides our new Director, Dr. Ed Duke, an opportunity to lead the Consortium beginning with the establishment of a strategic plan to chart our future course.

The SDSGC will use a balanced approach to establish a strategic plan consisting of a) objectives, b) activities, c) metrics, d) relevance, and e) resources for each of the seven Space Grant program areas (Consortium Management, F/S Program, Research Infrastructure, Higher Education, Precollege Education, Public Service and Workforce Development). For each objective we will develop activities and corresponding metrics. Our initial strategic planning effort will likely result in alignment of many of our existing activities to objectives, but could result in the elimination of some activities if they do not align well to an objective.

The Space Grant institutional members will meet in early October 2004 specifically for the purpose of establishing a strategic approach towards execution of the Space Grant program in South Dakota. At that meeting, we will establish and clarify the objectives for each of the seven programmatic areas. Our primary goal for the first year of our improvement plan is to establish and test a sound Strategic Plan for the performance of Space Grant activities. Other Consortia Strategic Plans will be used to model our Strategic Plan while capitalizing on SD’s unique capabilities and opportunities in Earth Science currently in place at member universities, EROS, and Tribal institutions. While we will certainly continue the activities of the past years during this period, the emphasis and priority of the SDSGC management will be the development of our Strategic Plan.

When establishing SDSGC objectives, we will consider the overall objectives of the National Space Grant program, the needs in the State of South Dakota, and the strengths and weaknesses of our existing programs to ensure the relevance and success of our efforts. We will solicit input on SDSGC’s Strategic Plan and objectives from the

existing SD NASA EPSCoR Technical Advisory Committee (TAC), as well as from the External Program Evaluator described in Strategic Plan section 1.9.

Appropriate metrics will be developed for each objective and activity. In some cases the metric may be relatively easy to establish, such as the number of fellowships or scholarships and the distribution of those awards to minority students. In other cases the metric may be more difficult, such as determining how well we have serviced the public. Metrics will be aligned to objectives and will be established for each objective. We realize that good use of metrics will drive our performance, and thus, the development of these metrics must be carefully considered. We expect our use of metrics to improve over time.

We will use our quarterly meetings to review activities and assess our progress toward meeting objectives. By using the strategic planning table to discuss the objectives and performance relative to the metrics will concentrate our periodic internal review on those elements necessary to ensure the successful execution of our Space Grant program in South Dakota. Once per year we will use a quarterly meeting as an annual performance review meeting to thoroughly evaluate our performance against the objectives. We will invite a small number of outside reviewers to engage in the evaluation process. Individuals from our affiliates, from the State of South Dakota, as well as the NASA Space Grant Office, will be invited to participate in the review. Participants will be provided with our strategic planning approach in advance. (Again, see Program Evaluation description in attached Strategic Plan, section 1.9).

### **C) Overall Program Evaluation**

**Objective:** *To develop SDSGC's Strategic Plan in concert with 1) the relevant sections of the State's 2010 Initiative, 2) the mission statements and objectives of Consortium members and affiliates, and 3) input from the existing Technical Advisory Committee of the SD NASA EPSCoR Program.*

**Timeline:** *Fall 2004 – Winter 2005.*

**Metrics:**

- *Presentation of Strategic Plan to State government officials and TAC in winter 2005.*
- *Survey of SDSGC member and affiliate mission statements, objectives, and goals.*
- *Annual alignment of Strategic Plan with member/affiliate mission statements, objectives and goals.*

#### **Aligning Space Grant Objectives with State Needs:**

As unveiled by South Dakota's Governor Mike Rounds this past year, the "2010 Initiative" is a series of specific goals and objectives for improving South Dakota's economic growth, visitor spending, and quality of life by the year 2010. Goal Three of the Initiative is for South Dakota to become a recognized leader in research and technology development by 2010. Achieving this goal begins with securing a national deep-underground laboratory in the now-closed Homestake Gold Mine. As reported for the last several years in SDSGC's progress reports and mentioned in the PPR report, SDSGC has been actively involved in helping to make the proposed underground science lab a reality in South Dakota. An office has already been created and the state is taking steps for conversion in anticipation of receiving federal approval on the project. Because the Homestake lab project could yield an economic, scientific and educational goldmine for South Dakota, providing jobs and spawning service and support industries that would ripple throughout the state, SDSGC will continue to align with this important State need.

The 2010 Initiative seeks to improve SD's current national ranking of 53<sup>rd</sup> for NSF funding to at least 30<sup>th</sup>. In addition, the Governor's 2010 Initiative is specifically geared to promote further cooperation between the State, private industry, and the USGS EROS Data Center in Sioux Falls. Because EROS Data Center has remained a very active institutional member of SDSGC, the Consortium is well poised to provide student and faculty researchers that will not only benefit from collaborative research between EROS and individual universities, but also will continue to develop research infrastructure primarily in the area of Earth System Science. This will capitalize on our expertise in remote sensing, GIS, and advanced image processing. SDSU recently established a Center of Excellence for GIS that is presently in its early stages of development, providing another excellent resource for Consortium collaboration. Likewise, SDView (funded through the USGS AmericaView initiative) will continue to have a strong connection to SDSGC. South Dakota is a charter member of the AmericaView organization, which is a nationally coordinated program to advance the availability, timely distribution, and widespread use of remote sensing data and technology through education, research, outreach, and sustainable technology transfer to the public and private sectors. Continued research in these geospatial subject areas with the Consortium's industrial affiliates such as Horizons Inc., SAIC, RESPEC, and others, will compliment our cooperative efforts between government and industry. This is a natural extension of long-standing SDSGC research objectives that align very well with State needs. Additionally, such efforts will aid in our overall development of research infrastructure to improve our national ranking in research capabilities.

## **D) Consortium Operations and Recruitment of Underrepresented Minorities**

### ***Objectives:***

- *Manage active, affiliate-wide participation and develop a mechanism for adding/dropping affiliates.*
- *Continue current programming to underrepresented minorities as well as further develop and increase partnering activities and services.*
- *Ensure recruitment and retention of underrepresented minorities at affiliate institutions, as well as ensure a consistent, qualified pipeline to NASA.*
- *Become more inclusive of Space Science as a target enterprise.*

***Timeline:*** Probationary period and beyond.

### ***Metrics:***

- *Establishment of Manager of Special Projects for NASA Workforce Development at Consortium Headquarters Office (a new position as of SDSGC's PPR reporting period).*
- *Quarterly meetings with invitations to all affiliates.*
- *Document all existing and new underrepresented student project initiatives.*
- *Approve policy for adding/dropping affiliates at October 2004 Strategic Planning Meeting.*

SDSGC will develop an American Indian Initiative comprised of three pillars: 1) infrastructure and partnership building, 2) motivation of students, and 3) curriculum enhancement and teacher training. This will link directly to SDSGC's NASA Workforce Development Program. SDSGC's Workforce Development Program Manager will work with each of the educational affiliates in streamlining programming and activities to ensure recruitment and retention of underrepresented minorities.

In order to align more with NASA's Space Science enterprise, the Consortium will seek to increase participation from the following existing resources in South Dakota: a) Sinte Gleska University's publication of "Lakota Star Knowledge" and current space science programs with NASA, b) Oglala Lakota College's Star Lab Planetariums, c) SDSM&T's unmanned aerial vehicle CAMP Team and Aero Team, d) Badlands Observatory, e) SD's Solar System Ambassador Program, and f) Black Hills Astronomical Society.

### **Affiliate participation in Consortium decision-making process:**

Currently, there are 30 affiliates of the SDSGC. To correct the identified deficiency in affiliate participation, a rotating position on the Consortium Management Team has been created and will be filled annually or biannually by an affiliate member. As indicated earlier, the Consortium Management Team currently consists of representatives from the four institutional members. Affiliates that elect to fill this rotating position must be willing to attend quarterly meetings and participate in the Consortium decision-making process at the level of the four institutional members. This position will be announced and filled at the Fall 2004 Consortium quarterly meeting and will help assure that affiliates have an active role in the decision-making process, including the distribution of Consortium funds and F/S awards. In addition to this, Consortium management will encourage a higher level of participation by all affiliates at Consortium quarterly meetings. To clarify the benefits and expectations of membership in the Consortium and foster more meaningful engagement of all of the Consortium's 34 members and affiliates, guidelines will be developed that outline the roles and responsibilities of management, member institutions, and all categories of affiliates (Strategic Plan section 1.3)

One of the reviewers questioned the level of involvement of SDSGC's 34 members and affiliates and pointed out that the majority of funding goes to SDSM&T and SDSU. This is a valid concern. The funding structure of SDSGC has remained relatively constant for at least the past 5 years. There has been no increase by NASA to the base funding for Space Grant in South Dakota during that period and the Consortium management has not seen the need to alter the funding situation. However, the PPR review has provided an opportunity to reflect on this. While the SDSGC has provided annual Program Initiation Grants (PIG) project funds to various educational affiliates of the Consortium, this funding has been relatively limited. The SDSGC Management Team will work with affiliates to consider allocating an agreed upon percentage of the budget to affiliate members for Consortium projects and/or fellowships. Hence, the Consortium's annual budget will become an agenda item during appropriate quarterly meetings.

SDSU plans to conduct a marketing survey aimed at improving the Space Grant Consortium's relationship to relevant businesses and industries in South Dakota. SDSU will implement a simple survey tool to find out what unmet needs exist and where Space Grant might be of service to these industries.

By October 2004, the SDSGC Management Team will approve a mechanism for adding/dropping affiliates along with a 2-page manual to be distributed to all prospective new affiliates that describes "who we are" and includes: a)



involvement opportunities, b) benefits of involvement, c) Space Grant objectives, goals, and perhaps some example program activities, d) processes and meetings, and e) expectations of affiliation.

<b>Measurable objectives</b>
<b>Fellowship/Scholarship (F/S) Program</b>
<ul style="list-style-type: none"> <li>• Formalized process of announcing, reviewing, selecting, and assessing fellowships and scholarships.</li> <li>• Increased fellowship funding to women and minority students.</li> <li>• Development of an American Indian transfer scholarship program.</li> </ul>
<b>Strategic Planning</b>
<ul style="list-style-type: none"> <li>• Established and tested Strategic Plan including a vision and mission.</li> <li>• Establishment of an understanding of critical needs of South Dakota and SDSGC to ensure student fellows and faculty researchers develop projects with “Problem Solving Relevance” and student fellows are allowed an option where they experience the application of their work.</li> <li>• SDSGC Strategic Plan, goals and objectives meet State needs.</li> </ul>
<b>Overall Program Evaluation</b>
<ul style="list-style-type: none"> <li>• SDSGC’s Strategic Plan developed in concert with 1) the Governor’s 2010 Initiative identifying State needs, 2) the mission statements and objectives of Consortium members and affiliates, and 3) input from Technical Advisory Committee and External Program Evaluator.</li> </ul>
<b>Consortium Operations and Recruitment of Underrepresented Minorities</b>
<ul style="list-style-type: none"> <li>• Active, affiliate-wide participation and policy for adding/dropping affiliates.</li> <li>• Increased continuation of current programming to underrepresented minorities.</li> <li>• Documented recruitment and retention of underrepresented minorities at affiliate institutions and continuation of qualified pipeline to NASA.</li> <li>• Increased Space Science programs.</li> </ul>

**Participation of consortium affiliates**

- SDSGC Institutional Members notified of Probationary Status on July 14, 2004.
- Teleconference with Institutional Members on July 21, 2004.
- Invitations to participate and submit comments sent to all Consortium members and affiliates with draft versions of Improvement Plan on July 27, August 2, and August 10.
- August 5<sup>th</sup>, 2004 Improvement Plan Meeting in Chamberlain, SD attended by:
  - \* Tom Durkin, Deputy Director and Outreach Coordinator, SDSGC, SDSM&T
  - \* Jacquelyn Bolman, Manager of Special Projects-NASA Workforce Dev., SDSGC, SDSM&T
  - \* Kevin Dalsted, Associate Director, SDSGC, South Dakota State University
  - \* Greg Johnson, Science Dept. Manager, USGS EROS Data Center
  - \* Daniel Swets, Associate Director, SDSGC, Augustana College
  - \* James Rattling Leaf, Developer, Sicangu Policy Institute, Sinte Gleska University
  - \* Kristie Maher, Executive Director, South Dakota Discovery Center and Aquarium
 (It is noted that Ed Duke, SDSGC Director, was out of the country and could not attend).
- Written responses received from Affiliate members including Barrick Gold Corp., National Weather Service, Oglala Lakota College, Lake Area Technical Institute, and Horizons, Inc. Comments incorporated into Improvement Plan.
- Three Management Team teleconferences and Sept. 10, 2004 quarterly meeting.
- Nov. 12, 2004 meeting with NASA HQ personnel.

**Monitoring and evaluation methodology**

Starting with the initial development of the Consortium’s Strategic Plan at the October 2004 quarterly meeting, the plan will continue to be reviewed at quarterly consortium-wide meetings. In addition, SDSGC will host an annual performance review and update of the Strategic Plan in collaboration with consortium affiliates. SDSGC will develop an annual performance assessment to determine what has been completed, to ensure that outcome indicators have been met, and to determine whether the data required to be reported to NASA has been gathered. SDSGC will integrate input from the NASA EPSCoR Technical Advisory Committee (TAC) and the External Program Evaluator.

## Anticipated Outcomes

As a result of implementing the measures presented in this Improvement Plan over the next year, the SDSGC anticipates achieving the following outcomes by the end of the probationary period and maintaining them in the coming years. Important improvements will include, but are not limited to, an approved Strategic Plan and a formalized, documented process for our Fellowship/Scholarship Program. These new efforts will provide the Consortium with a framework to gauge success, make adjustments where necessary to stay on target with the desired direction of the Consortium members and affiliates, and report data to NASA in easily measurable terms.

<b>Anticipated Metrics</b>
<b>Fellowship/Scholarship (F/S) Program</b>
<ul style="list-style-type: none"><li>• <i>Development of criteria (set of standards) formalizing the F/S process which will be outlined on the Consortium website and followed by all Consortium members.</i></li><li>• <i>Number of institutions receiving F/S awards increased by one.</i></li><li>• <i>Awards equal or exceed 20% to minorities and 50% to women.</i></li><li>• <i>Development and distribution of a "fellowship handbook".</i></li></ul>
<b>Strategic Planning</b>
<ul style="list-style-type: none"><li>• <i>Completed and approved Strategic Plan including all 7 Space Grant Program Areas to be assessed quarterly and updated annually.</i></li><li>• <i>Collaboration with all members and affiliates.</i></li><li>• <i>A minimum of one proposal submitted to an outside funding agency to further develop and support programming and activities.</i></li></ul>
<b>Overall Program Evaluation</b>
<ul style="list-style-type: none"><li>• <i>Presentation of Strategic Plan to State government officials and TAC..</i></li><li>• <i>Survey of SDSGC member and affiliate mission statements, objectives, and goals.</i></li><li>• <i>Annual alignment of Strategic Plan with member/affiliate mission statements, objectives and goals.</i></li></ul>
<b>Consortium Operations and Recruitment of Underrepresented Minorities</b>
<ul style="list-style-type: none"><li>• <i>Establishment of Manager of Special Projects for NASA Workforce Development at Consortium Headquarters Office (a new position as of SDSGC's PPR reporting period).</i></li><li>• <i>Invitation to all affiliates to participate in quarterly meetings.</i></li><li>• <i>Document all existing and new underrepresented student project initiatives.</i></li><li>• <i>Approved policy for adding/dropping affiliates.</i></li></ul>

## Schedule of Improvement Plan Implementation

### **July/August 2004**

- Assessment of PPR review comments and development of Improvement Plan by Consortium members and affiliates.
- Consortium-wide meeting in Chamberlain, SD to further develop Improvement Plan.
- Submission of Improvement Plan to NASA HQ.
- Development of criteria (set of standards) to formalize the student fellowship process to be outlined on the Consortium website and followed by all Consortium members.

### **September 2004**

- Promotion of student fellowship/scholarship program statewide per qualifications set by SDSGC
- Develop American Indian student fellow transfer scholarship program.
- Model the draft Strategic Plan on other Consortia Strategic Plans while capitalizing on SD's unique capabilities and opportunities in Earth Science currently in place at member universities, EROS, and Tribal institutions.
- Survey SDSGC member and affiliate mission statements, objectives, and goals.

### **October 2004**

- Development and distribution of student fellowship handbook.
- Quarterly meeting to further develop SDSGC's Strategic Plan in concert with 1) the relevant sections of the Governor's 2010 Initiative (State needs), 2) the mission statements and objectives of Consortium members and affiliates, and 3) input from the existing Technical Advisory Committee (TAC) of SD NASA EPSCoR.
- Approve policy of adding/dropping affiliates and associated handbook at 2004 Strategic Planning Meeting.
- Revolving affiliate position will be announced and filled.
- Development of American Indian Initiative comprised of three pillars: 1) infrastructure and partnership building, 2) motivation of students, and 3) curriculum enhancement and teacher training, that will link directly to SDSGC's NASA Workforce Development Program.
- SDSGC's Workforce Development Program Manager will work with educational affiliates to streamline programming and activities to ensure recruitment and retention of underrepresented minorities at affiliate institutions and ensure a consistent qualified pipeline to NASA.
- Management Team develops Consortium budget, including pursuit of outside "match" funding for SDSGC.

### **November 2004**

- SDSGC Student Fellowship Summit.
- Strategic Plan draft is completed and forwarded to NASA and SDSGC affiliates for review and input.
- SDSGC affiliates policy and handbook is sent to all affiliates.
- Continue development of SDSGC's Strategic Plan in concert with 1) the relevant sections of the State's 2010 Initiative, 2) the mission statements and objectives of Consortium members and affiliates, and 3) input from the existing Technical Advisory Committee of the SD NASA EPSCoR Program.

### **January – June 2005**

- SDSGC will submit at least one proposal to an outside funding agency to further develop and support programming and activities.

### **March 2005**

- Develop and host an annual "Space Grant Capital Day" in Pierre where SDSGC representatives provide an update to the Governor and Legislators on programming.

### **April 2005**

- Strategic Plan is finalized and tested.
- Presentation of Strategic Plan to State government officials and Technical Advisory Committee.

## Consortium Concurrence Statement:

Representatives of SDSGC's institutional members consisting of SD School of Mines & Technology, SD State University, Augustana College, and the USGS EROS Data Center have attended meetings to discuss this improvement plan. Additionally, all affiliate members of the Consortium were invited to participate in an August 5, 2004 meeting to discuss the plan and provide input at the meeting or via telephone and e-mail. Hence, all members and affiliates that chose to participate in the development of this plan indicate concurrence with the plan by their signatures below.

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Edward F. Duke, Ph.D. – Director, SDSGC  
SD School of Mines & Technology

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Gregg Johnson – Science Dept. Manager  
USGS EROS Data Center

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Kevin Dalsted – Associate Director, SDSGC  
SD State University

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Daniel Swets, Ph.D. - Associate Director, SDSGC  
Augustana College

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James Rattling Leaf - Land and Natural Resource  
Developer  
Sicangu Policy Institute, Sinte Gleska University

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Ron Dyvig - Director  
Badlands Observatory

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Executive Director  
SD Discovery Center & Aquarium

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Larry Deibert, President  
Horizons, Inc.