



**DEPARTMENT OF EARTH, ATMOSPHERIC, AND PLANETARY  
SCIENCES  
STRATEGIC PLAN: 2015-2019  
DRAFT: AUGUST 2015**

## **PREAMBLE**

The Department of Earth and Atmospheric Sciences was established in Purdue's College of Science in 1967. More recently, the department has undergone a major addition to its research and teaching programs, with the creation of a Planetary Group, and the associated name change in 2012 to the Department of Earth, Atmospheric, and Planetary Sciences (EAPS). The combination of three interdisciplinary programs into one coherent department makes us unique within the university. Our programs in research, graduate and undergraduate education, and public service make EAPS a leader in the College of Science and beyond. Our research is globally recognized, our students are highly valued by employers, and our alumni are making significant contributions in academia, industry, government, and the space program.

The strategic plan described herein has the objective of enabling us to continue to increase the impact of our department on our local and global communities over the next 5 years. It has been designed to take advantage of emerging research opportunities and challenges, to shore up areas in the department associated with recent faculty departures, and to continue to build our graduate and undergraduate programs toward high national rankings. This plan was developed by a strategic planning committee based on numerous discussions and feedback from the entire department. This process helped to highlight areas of growth and necessary change, critical to meeting our goals and aspirations, which are ambitious, but achievable.

## **Our Vision**

To be a preeminent department for fundamental discoveries through research, education, and outreach in earth, atmospheric, and planetary sciences, leading to a positive impact on society.

## **OUR MISSION**

The mission of the Department of Earth, Atmospheric, and Planetary Sciences is three-fold, as it ties into Purdue University's Mission of serving the citizens of Indiana, the United States, and the world through discovery that expands the realm of knowledge and learning through dissemination and preservation of knowledge, and engagement through exchange of knowledge.

Specifically, the current mission of EAPS is focused on:

- I. **Discovery:** Research within EAPS aims to advance our basic understanding of the processes and history that have shaped our planet and our celestial neighbors, from the atmospheric shells to the deep interiors. We strive to continue a long and successful history of engagement in interdisciplinary scientific research at a globally recognized level that addresses some of the most important and vexing problems in nature, including plate tectonics, severe weather, evolution of our planets, and environmental and energy sciences.
- II. **Learning:** We seek to recruit and train students with strong academic and leadership potential, providing them with the scientific and personal skills to make new discoveries and translate their knowledge into developments that improve the human condition, and foster their growth as leaders in academia, education, industry, and public service.

- III. Engagement:** We are committed to training tomorrow's K-16 geoscience educators, providing them with a broad understanding of geosciences and the ability to excite and inspire their students. We strive to share this knowledge with our local and global community in an engaging fashion. We endeavor to share our discoveries and our student's achievements with our professional community and the general public and engage in partnerships with our alumni and corporate partners to enhance the educational and research environment.
- IV. Crosscutting Strategies:** We strive to utilize crosscutting strategies to accomplish our objectives in a multi-cultural, diverse environment that enriches the academic experience for our faculty, staff, and students alike.

## **OVERALL STRATEGIC STRENGTHS**

EAPS has recognizable strengths in our focus areas for disciplinary and interdisciplinary research, as well as for improving society through the application of new scientific knowledge, and innovative educational programs. These include:

- Diverse range of expertise across a broad group of earth/planetary system disciplines, including geologic, geophysical, environmental, climate, severe weather, and planetary orbital and surface processes, with the ability to grow and expand into key areas such as unconventional energy
- Strong record of high profile publications across a diverse range of research areas
- A preeminent planetary science program that is one of a handful to specifically offer an undergraduate Planetary Science Bachelor's degree
- EAPS faculty are leaders and heavily invested with multiple centers at Purdue and across a variety of disciplines, including the Purdue Climate Change Research Center (PCCRC), Center for the Environment (C4E), and the U.S. China Eco partnership
- Jointly run with the Department of Physics, the Purdue Rare Isotope Measurement Laboratory (PRIME Lab) is the top facility for accelerator mass spectrometry measurements in the nation
- Strong component of field data collection within a wide array of disciplines
- Nationally and internationally recognized faculty, including National Academy of Science members, distinguished professors, and joint faculty appointments with departments across campus, as well as the hosting of national and international visiting scholars
- Internal access to the latest in high performance computing
- Faculty who are committed to the advancement of students from underrepresented minority groups
- A strong outreach program supporting and enhancing K-16 science education in the Earth, atmospheric, and planetary sciences throughout the state

## **OVERALL STRATEGIC CHALLENGES**

While our interdisciplinary nature presents great opportunities for collaborations, it also presents challenges to our research and educational programs which must be addressed to allow us to become one of the premier Earth, Atmospheric, and Planetary Science Departments in the country. These challenges include:

- Low number of majors compared to other College of Science departments, though comparable to similar departments at peer institutions
- Low number of total student contact hours being taught by EAPS compared to other College of Science departments, though comparable to similar departments at peer institutions
- A challenging external funding environment
- Lack of strong cross-disciplinary collaboration within EAPS research themes
- Retention of faculty and staff

- Disseminating the value of an EAPS degree relative to other science degrees at Purdue or peer institutions (e.g. why choose EAPS?)

## **GOALS AND STRATEGIES**

To achieve the department's vision we will employ strategies that target crosscutting needs as well as our specific goals.

### **I. DISCOVERY**

We aim to be a department where scientific innovation, strong synergies among faculty, and leadership in the global research community are core values that lead to high impact discoveries with fundamental implications for the broad science community and the needs of society. We strive to provide a vibrant research environment free of barriers to faculty achievement in disciplinary and cross-disciplinary discovery that will launch, nurture, and promote the careers of the next generation of leaders in science and society.

#### **GOAL 1a: Promote Growth of Atmospheric Science Research Program**

Synopsis. With three new hires in 2015, the Atmospheric Science Program is poised to expand its research and teaching programs to establish itself as the premier atmospheric group in the region and one of the top in the nation.

#### Strategies:

- 1) Enhance Extreme Weather Prediction and Mitigation.

Modern weather forecasting has become increasingly reliable in part due to advanced simulation capabilities and modern observational tools. Recent faculty hires in these areas now enable the group to connect and expand our research capabilities, our teaching program, and our ability to recruit top-level undergraduate and graduate students. To focus and coordinate these efforts, the department will establish a center for the study of extreme weather.

The goals of this center will be as follows:

- (a) Coordination. Establishing a nationally recognized research and teaching center with a director(s) and core faculty governance and outside advisors will enable a focused effort on procurement of research and teaching directions, funds, education programs, procurement of instruments and data, and outreach efforts.
- (b) Observational Research Program. An observational research program utilizing active radars, satellite data, and other observational data sets is critical to becoming a preeminent extreme hazards research and teaching program. Access to a broad range of data would give the group a research advantage over similar programs in the region, enable students to be more competitive entering the job market, and would enhance recruiting efforts. To this end the center will acquire (lease and/or buy) several different types of mobile and stationary radars and develop the means to provide this and other data for both in house research and teaching as well as external forecasting efforts.
- (c) Numerical Prediction Research Program. Storm-scale numerical weather prediction modeling constrained by robust observational data lies at the center of a strong extreme weather prediction program. To this end, the center will develop numerical modeling tools working toward increasing tornado, severe thunderstorm, and flash flood warning lead times, in line with the goal of the National Oceanic and Atmospheric Administration (NOAA) Warn-on-Forecast research program. The center will also develop the means to share predictions with local and regional forecasting groups.

(d) Mitigation Research Program. The ultimate goal of a robust, extreme weather prediction program is the ability to mitigate the socio-economic impacts of extreme weather and climate change. This is best accomplished by coordination of a broad spectrum of disciplines that includes observations and modeling in extreme weather and climate change, statistics, risk analysis, economics, civil engineering, and political science. The center will seek collaborations across campus and organize a coordinated effort to develop a unique research and teaching program in extreme weather mitigation with a strong outreach component to inform and educate local and regional civil authorities.

2) Enhance Climate Modeling and Observation Expertise. A strength of our Atmospheric Group important to build on lies in climate modeling on a range of scales, as well as observations of atmospheric composition and earth/atmospheric interaction. Faculty hires by the department in the areas of climate modeling and observation will be sought to expand our current capabilities, especially as related to regional climate and its influence on extreme weather, and to take advantage of current and future funding opportunities within and beyond Purdue.

### **GOAL 1b: Broaden the Geology and Geophysics Group**

Synopsis. As with the other areas of research in EAPS, continued growth of research expertise in the Geology and Geophysics Group is vital to working toward a goal of being one of the best programs in the region and beyond. The most important research directions to take will be those that build on existing strengths, foster collaborative opportunities within the department, and enhance core teaching capabilities.

#### Strategies:

- 1) Integrate Thermochronology Expertise into Geology and Geophysics Group: The Geology and Geophysics group currently has the expertise to measure the motion of earth's surface over timescales of years to decades to help understand earthquakes, volcanoes, and plate tectonics. Cosmogenic nuclides measured at PRIME Lab (jointly run by Physics and EAPS) are used over timescales ranging up to a few million years to understand processes including soil formation and erosion, glacier advance and retreat, and archaeology and human evolution. A specialist in thermochronology would enable the group to expand our geochronology to timescales of  $10^6$ - $10^9$  years, covering the entire timescale of geologic and solar system history. Such expertise would enable greater collaborations among our faculty in tectonics, landscape evolution, biological evolution, paleoclimate, and planetary science. Depending on their particular expertise, hires in this area could help the group strengthen its ability to teach tectonics, mineralogy, or other core subjects.
- 2) Stephen and Karen Brand Endowed Chair in Unconventional Energy: Stephen R. Brand, EAPS alumnus, and his wife, Karen, have given a gift to create the department's first endowed chair. This endowed chair will be used to recruit a researcher to capitalize on EAPS' strengths in geology and engineering, and to build and expand the research knowledge in this emerging area. The forward momentum created by this position will also offer students the opportunity to learn in-demand skills that will set them apart from other graduates.

### **GOAL 1c: Expand the Planetary Science Program**

Synopsis. In 2012, the department officially changed its name to include planetary science, and in the spring of 2014 the group added a fourth faculty member. The group seeks to become one of the preeminent planetary science research programs in the country. In addition, the group has begun to develop and implement core undergraduate and graduate curriculums, including large enrollment courses that will increase the department's student contact hours. These objectives are limited by the sparse number of faculty, and therefore the group has a strong need for additional faculty members.

### Strategies:

- 1) Integrate Exoplanets Theme into Planetary Group: A major growth area in Planetary Sciences has become the discovery and characterization of now detectable planets around other, very different solar systems. With NASA's priority of finding evidence of life elsewhere in the universe (and it not showing up on Mars) and new telescope missions being planned, exoplanet exploration has the potential for great interest well beyond the academic community. A faculty hire in this area would enable the Planetary Group to expand in an emerging research area not covered by present faculty. It would also enable new core classes at the graduate and undergraduate level, and have great potential for developing popular classes for non-majors.
- 2) Integrate Planetary Atmospheres Theme into Planetary Group: Current planetary faculty primarily study rocky surfaces and orbital mechanics. Expansion of research capabilities into Planetary Atmospheres would broaden the group's scope to encompass the gas and ice giants, as well as terrestrial atmospheres. Complementing a hire in exoplanets, where we are now able to obtain information regarding exoplanet atmospheric composition, such an expert in planetary atmospheres would cement a well-rounded planetary group and enable potential research and teaching collaborations with the department's Atmospheric Group.
- 3) Integrate Spacecraft/Space Mission Themes into Planetary Group: Develop a research and teaching collaboration between the Planetary Group and the [School of Aeronautics and Astronautics for spacecraft design and mission planning that spans both science and engineering disciplines](#). Such a program would be one of the first in the country to cover the entire span of spacecraft missions, providing a unique environment for cutting-edge research, development of mission proposals, and preparing students for a variety of space-related careers.

### **GOAL 1d: Increase Research Productivity and Grant Dollars**

Synopsis: Although EAPS has been effective in high-visibility research productivity within individual research groups, and many of these groups have been highly successful on obtaining external research funding, there is additional potential to develop large-scale synergies within and across focus areas and increase the visibility and stature of these groups outside of Purdue. Realizing these opportunities will require internal adjustments in the organization, administration, and policies of the department, as well as investment in the department targeted at retention and support of promising junior faculty and recruitment of senior faculty who are leaders in their fields.

### Strategies:

- 1) Leverage focus areas and groups, particularly those which are well-established and have strong leadership, to develop one or more EAPS-led centers of excellence that generate departmental recognition and provide stable, recurring funds for practical and innovative research through some combination of federal, foundation, state, and corporate support.
- 2) Current research groups should take advantage of the expansion of funding in emerging areas, such as unconventional energy resources, by hiring a senior faculty and strengthening collaboration with other departments, centers, and colleges within and outside Purdue.
- 3) Increase potential gift support towards endowed chairs, institutional post-docs, graduate scholarships, and/or a visiting scholars program.
- 4) Promote, facilitate, and reward the pursuit of large EAPS-led, multi-investigator projects by:
  - a) Encouraging and supporting regular focus group meetings and seminars that increase the degree and scale of interaction within and among groups.

- b) Providing extra administrative support and teaching relief for faculty involved in large proposal development and the leadership or administration of large projects.
- c) Provide equitable workloads that balance teaching, research and service roles such that each faculty member contributes in substantial and significant ways to the department.

**METRICS** - MEASURED BY QUANTIFIABLE INCREASES THROUGH YEAR-OVER-YEAR GROWTH

- Successful tenure-track faculty hires in climate modeling and observations
- Successful tenure-track faculty hires in extreme weather modeling and observations
- Successful tenure-track faculty hire in thermochronology
- Successful faculty hire to fill the Stephen and Karen Brand Endowed Chair in Unconventional Energy
- Successful tenure-track faculty hires in exoplanets and planetary atmospheres
- Number of publications in peer-reviewed journals
- Number of high-visibility, big-impact papers (e.g., Nature, Science, PNAS)
- External funding in terms of the number of grants as well as dollars. Specifically 100% of faculty will have funding or have submitted a proposal every year for new funding.
- Number of faculty awards from scientific societies, foundations, and agencies
- Number of centers directed and funded through efforts of EAPS faculty
- Department status in the United States National Research Council (NRC) rankings and U.S. News & World Report college rankings.

**II. LEARNING**

**GOAL 2a: Growth of Atmospheric Science Teaching Program**

Synopsis: The Atmospheric Sciences Program supports a majority of the department’s undergraduate majors despite being administered by a minority of the faculty. The number of atmospheric faculty has decreased over the past several years, leading to increased teaching and research pressures. At the same time, increased competition from new atmospheric programs in the Midwest makes recruitment of students more challenging. The department will seek new faculty hires over the next few to support the current and future demand for atmospheric science teaching, and to continue building our reputation for producing high-quality graduates. The following strategies should help attract high-quality undergraduate majors and MS students to EAPS, and further distinguish the department from other meteorology programs around the country.

Strategies:

- 1) Undergraduate research opportunities: Continue to create opportunities for undergraduate students to participate in research projects, both in organized courses and via directed study with individual faculty, especially the capability to conduct field work related to extreme weather. As students are often inspired to study atmospheric science as a result of their own personal experiences with weather and climate hazards, access to world-class research in these areas, especially through the coordinated research programs of CEWPAM, can be key to attracting the best and brightest of those students.
- 2) Practical weather forecasting/communication experiences: A significant fraction of EAPS undergraduate majors (and some graduate students) express the desire to work in a weather forecasting-related field, and effective communication of weather information is a vital component of the forecasting process. To this end the department has developed a “weather service” where they provide weather forecasting information to a variety of customers, and . a “green screen” facility to provide opportunities to gain practical experience in broadcast meteorology. The department will seek to expand these types of opportunities through the development of a broadcast meteorology course and degree track, and by increasing simulated

broadcast capabilities.

- 3) Computing/data-driven curriculum: Recently there has been a tight job market for BS-level graduates looking for traditional weather forecasting-related positions, but there has been a steady demand for graduates that possess both discipline-specific knowledge and computing skills. EAPS has an opportunity to expand in this area through renewed emphasis on numerical modeling and data analysis throughout the curriculum. The department has enjoyed a fruitful partnership with Purdue's Rosen Center for Advanced Computing (RCAC) in areas of both discovery and learning. We can build on this successful partnership by weaving computing throughout the undergraduate curriculum, as well as making some of these courses offered to MS graduate students.

## **GOAL 2b: Development of Environmental and Energy Science Degree Track**

Strategies:

- 1) With the increasing impact of global change, industrial and agricultural practices, and the challenges of an increasing global population, there is heightened concern for the health of our environment both regionally and globally. In addition, many of the greatest challenges to a healthy environment center on development and utilization of conventional and unconventional energy resources. Thus, EAPS aims to develop a degree track for an undergraduate major that is focused on environmental and energy science. Separate research and teaching components of both environmental science and energy science already exist within the department. An integrated environmental and energy science track would be nearly unique in the nation by combining training in these two interrelated fields. With the recent hiring of assistant professors in geohydrology and stable isotope geochemistry, as well as the impending creation of an endowed chair in unconventional energy resources, the coming years provide a great opportunity to further broaden EAPS course offerings in both of these areas, increase the level of practical experience for our majors, and to revitalize recruitment efforts.
- 2) Strengthen Link between G&G Program and Energy-related Corporations: Many energy-related jobs require a minimum of an MS degree in geosciences or related fields. Thus EAPS is continuing to develop strong links with partnerships in the energy industry, and therefore sees an opportunity to further provide a skilled and knowledgeable workforce to them. One example is developing a 5-year, fast-track/combined BS/MS degree program that will offer students an option to condense overall time to complete a terminal MS degree by at least a year. Such a program could also serve as a recruitment tool for undergraduate students whose career aspirations are directed towards the energy industry.

## **GOAL 2c: Revitalize EAPS Geoscience Education Program**

Synopsis: Loss of several key faculty has hampered our Geoscience Education program that has a strong history in training graduate students for careers in geoscience education, teaching undergraduate geoscience classes to future elementary school teachers, and taking advantage of a significant sources of external funding opportunities. We seek to revitalize this program.

Strategies:

- 1) Additional Geoscience Education Faculty: A new faculty member who specializes in undergraduate geoscience education would provide the capability to teach our education classes and revitalize our graduate program. Combined with a strong research background, a faculty hire that integrates well into our department can provide both graduate and undergraduate education majors vital, practical research experience.

- 2) Increase engagement with geoscience education groups within other College of Science departments in an effort to work toward a more centralized and interactive geoscience education program within the college that would become more efficient to operate and more attractive to perspective majors.

### **GOAL 2d: Increase EAPS Undergraduate Majors and Student Contact Hours**

#### Strategies:

- 1) **Appointment of a Web Shepard to develop** our website and make more effective use of social media: The department can better promote the successes of our graduates and the excitement of our program through an upgraded EAPS website, including sites for thematic groups as well as individual faculty and students. It is especially important to highlight the undergraduate and graduate student experience, including research, laboratory work, and field trips.
- 2) Visit a number of Indiana high schools on recruitment trips.
- 3) Utilize freshman seminars to increase the visibility of EAPS to undeclared majors.
- 4) Increase the number of EAPS courses being taught in the summer
- 5) Increase the number of online EAPS courses being offered
- 6) Expand the EAPS offerings via the Study Abroad program.
- 7) Give short, 10-minute presentations to freshmen level, general education EAPS courses regarding EAPS majors and career opportunities in the geosciences.
- 8) Continue to emphasize our introductory classes.
- 9) Make the first semester class centered on the major
- 10) Post more videos on our website of students, field trips.
- 11) Change our freebies
- 12) Improve signs where possible
- 13) Launch weather balloons at Purdue events (e.g., BGR, Spring Fling)
- 14) Assemble an informational packet for high school guidance counselors
- 15) Increase the active recruitment of students from introductory classes
- 16) Attend/judge science fairs either in-state or nationally.
- 17) Design introductory (field-based) courses for summer or Maymester.

### **GOAL 2e: Continue to Strengthen EAPS Graduate Program**

Synopsis: EAPS has been successful in increasing the number of PhD's that it services in its graduate program, but recognizes that it has to be vigilant to continue this upward trend and attracting well qualified graduate students. This included increasing the number of graduate students in the department relative to the number of faculty FTE.

#### Strategies:

- 1) Increase the amount of extramural funding brought into the department which can be used to fund research assistantships and to attract quality students.
- 2) Increase the number of teaching assistantships allotted to the department by the College.



- 3) Increase the diversity of graduate students that apply and are admitted through cultivation of links and the creation of academic pathways with Historically Black Colleges and Universities (HBCU), Tribal Colleges and Universities (TCU), as well as other Minority Serving Institutions (MSI). This should particularly be done with those institutions employing our graduates as faculty or with whom we have active research and teaching collaborations.
- 4) Continue to offer a wide array of professional development programs and networking opportunities, especially with regards to visiting EAPS Alumni.
- 5) Continue to have a strong presence at national meetings.
- 6) Continue to host a graduate student expo to recruit top applicants.
- 7) Create and use Research Experiences for Undergrads (REUs) as a pathway to recruit top undergraduates from across the nation into the department's graduate program.
- 8) Advertise for research supported graduate positions in science publications such as EOS.

**METRICS** - MEASURED BY QUANTIFIABLE INCREASES THROUGH YEAR-OVER-YEAR GROWTH

- Number of undergraduate majors, with a goal to have 200 majors
- Number of graduate students, with a goal to have 100 graduate students
- Number of student contact hours, with a goal to be more in line with our peer institutions
- Successful creation of a 5-year, hybrid BS/MS Bachelor's degree
- Placement of undergraduates upon graduation
- Successful tenure-track faculty hire in geoscience education
- Placement of graduate students upon graduation
- Development and implementation of an undergraduate recruitment plan, especially related to underrepresented groups. This includes an updated EAPS website design for enhancing recruitment
- Number of proposals for graduate student training programs submitted and awarded
- Number of externally-funded graduate student fellowships and assistantships
- Development and implementation of a graduate recruiting plan that leads to increases in the number and quality of applications
- Graduate and post-doctoral student numbers and retention rates, including specifically women and underrepresented groups

**III. ENGAGEMENT**

Synopsis: EAPS faculty, staff and students have the capability and motivation to enthusiastically share their knowledge across the greater Purdue University community, K-16 students and teachers of Indiana, our alumni, and the general public. EAPS aims to engage diverse populations of learners through collaborative interactions on and beyond the campus, providing leadership and training for science education and the application of new scientific knowledge that will allow our alumni, friends, and the state of Indiana to meet global challenges through mutually beneficial interactions. We also anticipate that by increasing the visibility of EAPS-related research, increased opportunities for funded research and entrepreneurship will follow. Increased engagement will also serve as an important recruitment tool at all levels within the department.

**GOAL 3a: Increase the Department's Engagement with K-16 Teachers, Students, and General Public**

Strategies:

- 1) Increase media coverage and number of public lectures given by EAPS faculty and students.

- 2) Increase EAPS faculty, staff and student participation in K-16 student groups/clubs and activities, including national science fairs.
- 3) Expand subject matter and pedagogical workshops, seminars, and continuing education opportunities for in-service teachers.
- 4) Continue to grow teacher support through activities such as equipment loan programs, professional consultations and resource identification and sharing.
- 5) Continue to seek private foundation funding in support of strategic programs.
- 6) EAPS Silver Jubilee Celebration - The department will complete 50 years in 2017. This will provide us a unique opportunity to strengthen our engagement with our alumni, friends, and stakeholders. We will create a team consisting of faculty, staff, students, and members of alumni advisory board to plan and organize events to celebrate 50 years of EAPS success.

### **GOAL 3b: Leverage Expertise and Experience of EAPS Alumni**

#### Strategies:

- 1) More actively engage EAPS alumni to enhance the EAPS educational and research environment, and to assist in acquiring private funding for student and research focused initiatives.
- 2) Involve key alumni, from the industries and other entities/agencies, in the development and review of certain EAPS courses (such as Great Issues Courses) as they provide “real-world” input to help create state-of-the-art courses.

#### **METRICS** - MEASURED BY QUANTIFIABLE INCREASES THROUGH YEAR-OVER-YEAR GROWTH

- Number of outreach activities
- Number of public lectures
- Number of mass media interactions
- Number of instances of EAS faculty, staff, and student involvement with K-16 student groups/clubs
- Number of K-16 teachers, schools, and students impacted by outreach programs, workshops and seminars

## **IV. CROSSCUTTING STRATEGIES**

### **GOAL 4a: Increase Diversity**

Synopsis: As with the geosciences in general, EAPS suffers from low numbers related to diversity with respect to its undergraduate and graduate student majors, with only 10-11% of students at each level being from an underrepresented group. While the number of female students appears to be better represented at 40+%, the department realizes more can be done related to increasing the diversity of its faculty.

#### Strategies:

- 1) Develop activities that would promote underrepresented student engagement in the geoscience through cultivating their current interest in the natural environment and a sense of belonging.
- 2) Clearly map and enable underrepresented students to progress in learning pathways towards preparation for the workforce.
- 3) Encourage the use of learning communities in the classroom.

- 4) Have EAPS representation at scientific meetings focused on underrepresented groups such as the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), where attendance will include undergraduate and graduate students, as well as postdoctoral scholars.
- 5) Better utilize Purdue and National Society student organizations to promote an instant peer scientist network for incoming students and post-docs.
- 6) Offer a network of EAPS faculty who are committed to mentoring underrepresented minority students and post-docs.
- 7) Find and offer pathways for mentor training for EAPS faculty interested in being effective mentors for underrepresented students at all stages of their academic careers (undergraduates, graduate students, and post-docs).
- 8) Identify and utilize internal/external program expertise in recruitment and retention of a diverse faculty pool (e.g. ADVANCE).
- 9) Be more cognizant of search structures and procedures that promote a diverse application pool when seeking new faculty hires.
- 10) Utilize alumni as ambassadors on behalf of EAPS to participate in formal and informal diversity forums at schools and student recruiting events.

#### **GOAL 4b: Improve the Culture of the Department**

Synopsis: Faculty and students interact regularly within research thematic areas through various events (e.g. Crater Café, GaGgle seminar). A positive work culture will be cultivated by creating and fostering an environment that promote faculty, staff, and student interactions.

##### Strategies:

- 1) Increase number of meaningful and engaging social events that involve the whole EAPS team (faculty, staff, students, and post-docs).
- 2) Promote regular coffee hour with faculty and staff.
- 3) Celebrate success of faculty, staff, and students via the department newsletter, website, and departmental/college meetings.
- 4) Express appreciation and positive feedback directly to staff, students, and faculty for their contributions towards the success of the department, especially for any outstanding efforts.
- 5) Improve communication between faculty and students, especially regarding issues and events that are important to one group but potentially underappreciated by the other.

#### **GOAL 4c. Provide a Positive Environment for Faculty Development and Retention**

Synopsis: EAPS has lost a number of young and mid-career, productive faculty in the recent past. This has had the inevitable consequence of many new hires at the junior level. EAPS seeks to improve the environment for faculty to increase retention of its established faculty and to nurture the development of new faculty.

##### Strategies:

- 1) Endeavor to help faculty obtain the financial and technical support needed to achieve the full potential of their research, teaching, and engagement programs.

- 2) In addition to the Peer Advisory Committee (PAC) process, the department will promote mentoring for faculty that includes internal and external mentors, and which covers the range of faculty responsibilities.
- 3) The department will promote a more explicit approach to faculty development, including leadership development, increased information on non-traditional funding sources, support for collaborations with targeted international partners (sister university program), and development of a process for making teaching assignments that are matched to faculty needs and interests as well as student demand.
- 4) Continue to nominate our faculty for intramural awards as well as extramural awards in national and international scientific societies.
- 5) Search for private funding in support of endowed professorships and early career faculty positions.
- 6) Provide equitable workloads that balance teaching, research and service roles such that each faculty member contributes in substantial and significant ways to the department.

#### **GOAL 4d. Provide a Positive Environment for Staff Development and Retention**

Synopsis: EAPS has had high turnover and loss of staff due to budget cuts and a competitive work environment. This has had the inevitable consequence of increasing an already heavy workload. EAPS seeks to improve the environment to increase retention of its valuable and highly qualified staff and to nurture the professional development of all staff.

##### Strategies:

- 1) Provide an environment to promote mentoring for staff that includes internal and external mentors, and which covers the range of that particular individual's responsibilities.
- 2) The department will promote a more explicit approach to staff development, including leadership development, and expansion of skills.
- 3) As a goal, the staff will participate in at least one professional development opportunity per year.
- 4) Continue to nominate our staff for intramural awards as well as extramural awards as appropriate.
- 5) Provide equitable workloads among the various staff functions, including the consideration of hiring additional staff if needed.

#### **GOAL 4e: Perpetuate the EAPS Strategic Plan**

Synopsis: Implementation of strategic tasks and achievement of strategic goals requires yearly attention. To this end the department will create a Strategic Action Committee that shall commit to the following strategies.

##### Strategies:

- 1) Yearly assessments of the progress toward strategic goals.
- 2) Recommend department task priorities each year based on progress in implementation of the strategic plan.
- 3) Develop a hiring plan each year based on the strategic plan.
- 4) Recommend modifications to the strategic plan based on changes in the state of the department.

- 5) Report to the faculty each year regarding progress and recommendations regarding implementation of and changes to the strategic plan.

**METRICS** - MEASURED BY QUANTIFIABLE INCREASES THROUGH YEAR-OVER-YEAR GROWTH

- Percentage of applicants, interviews, offers, and yields from women and underrepresented groups
- Number of women and underrepresented faculty in leadership positions
- Faculty retention rates, including specifically women and underrepresented groups
- Development and implementation of a faculty mentoring plan
- Departmental faculty retention rate