May 07, 2009

# Sustainability Task Force Report

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## Sustainability Task Force Members

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## Executive Summary

In recent years, the challenges of diminishing global resources and current and future climate change have become part of everyone's consciousness. Creating and promoting a culture of sustainability has emerged as an important and growing part of the educational and outreach missions of San Jose State University and is one of President Whitmore's key goals for our campus. The Sustainability Task Force was charged with: 1) assessing best practices in higher education regarding sustainability, and to survey current sustainability practices, educational programs and research at SJSU, and 2) making recommendations to the Academic Senate and the President to build SJSU's sustainability programs and position SJSU to be a leader among universities in sustainability. Here we summarize our general recommendations for embedding sustainable practices in the culture of the university as well as our list of specific, top-priority action items to undertake relatively quickly.

General Policy Recommendations:

1. Establish a Sustainability Council as a permanent committee of the Academic Senate, charged with establishing sustainability goals, evaluating campus practices to promote sustainability, and recommending new goals, actions, and policies on an annual basis.

2. Fund a full-time Sustainability Director to oversee the implementation of sustainability directives and to seek external funding and community and corporate partners for sustainability initiatives. The sustainability director should have ties to both the academic and operational sides of the university and report at a high level to each.

3. Establish a Sustainability Faculty-In-Residence in each college, and parallel positions within non-academic units.

4. Use expert panels of SJSU faculty and external experts to bring information on specific topics to the Sustainability Council and to engage faculty and students in research, community service, and internship opportunities focused on sustainable themes.

5. Establish a Sustainability Research Institute as an Organizational Research and Teaching Unit (ORTU) that will serve as a vehicle to promote interdisciplinary research in areas such as environmental policy, sustainable practices in industry, agriculture, and

*Procurement (Administration and Finance)*
1. Enforce and expand Environmental Procurement Procedures.
2. Eliminate the purchase of virgin paper.
2. Establish and enforce sustainability guidelines for purchase of consumables and equipment.

*Curriculum and Research*
1. Identify and promote strategic, interdisciplinary multi-year research and project grants for sustainability.
2. Develop joint projects and programs with other universities, community colleges and K-12 schools.
3. Where appropriate, promote online classes and other modes of teaching that do not always require travel to campus as well as telecommuting for staff.
5. Identify and promote service learning and internships that address regional sustainability issues.
6. Secure funding for scholarships for students in sustainability-focused degrees and programs.

## Background to the Sustainability Task Force Report

Sustainability was defined by the World Commission on Environment and Development (1987) as activity that "meets the needs of the present without compromising the ability of future generations to meet their own needs". However, the human enterprise is currently not sustainable. According to the Living Planet Report 2008, produced by the World Wildlife Fund, Zoological Society of London and the Global Footprint Network, our rate of resource use is 31% greater than the earth's productivity. We are exceeding the earth's ability to meet our energy, food, and water demands. A few results of this ecological overshoot are the current species extinction crisis, our reliance on non-renewable fuels, destruction of the earth's rainforests, and the highest levels of $CO_2$ in the atmosphere in the last 650,000 years. To support the human population and the planetary processes on which we depend, we must significantly change the way we use the earth's resources. If we do not, we risk leaving our children a world that will not support them; we risk resource and biosphere collapse and, perhaps, a decline of the human population with it. Some researchers, such as David Ehrenfeld (Erhenfeld, D. 2005. The Environmental Limits to Globalization. Conservation Biology 19:318-326)' suggest that if planetary support systems collapse, the institutions, societies, and nations that will fair the best are those that have found ways to use the earth's resources sustainably.

To achieve sustainability, humans must use resources no faster than they are generated by the earth's systems. Meeting this standard requires depending on renewable energy sources, reusing all materials so that there is no waste, and using all resources only as fast as they are naturally renewed. Inherently, sustainability solutions must integrate and address the "triple bottom line"—ecology, economics and equity. For example, since approximately 50% of the human ecological footprint is from energy, reducing our energy use and moving to renewable and ecologically-benign energy sources is critical for reducing greenhouse gas emissions. Americans waste approximately 50% of the energy we use, so becoming efficient means reducing energy costs. Reducing energy needs and moving to renewables eliminates the need for fossil fuel driven power plants that degrade the environment of local communities. Achieving sustainable use of resources is the only way to ensure stable and healthy economies and societies.

In the last decade, universities and colleges have recognized they play a key role in leading society to a sustainable future. Annually, American colleges and universities serve 14.5 million students, people who will become our next leaders. Universities have an obligation to ensure their students are environmentally literate and understand their responsibilities in helping to create a sustainable society. Universities also must lead by example, greening all aspects of their operations. The Association for the Advancement of Sustainability in Higher Education (AASHE) lists almost 90 universities nationwide with varyingly levels of sustainability efforts. Most of these have campus sustainability directors and a range of programs to reduce energy use and materials waste. One of the most extensive programs is that at Arizona State University (ASU), which has a Global Institute for Sustainability with its own green building and a School of Sustainability. ASU policies and activities seek to promote sustainability in campus operations (energy, waste, transportation, buildings, food), curriculum, research, campus culture, and the community. Academic sustainability leaders must address all facets of their institution.

The CSU system and individual campuses have taken substantial steps recently to promote system-wide sustainability. Most notable is Executive Order No. 987: Policy Statement on Energy Conservation, Sustainable Building Practices, and Physical Plant Management for the California State University, issued by the Chancellor on August 2, 2006. EO 987 "reaffirms the

need to conserve energy in order to achieve the goal originally set in 2001 and reevaluated in 2005. Our new goal is to reduce consumption by 15% by the end of FY 2009/10, as compared to 2003/04." The EO states that, "The CSU shall develop a strategic plan for energy procurement and production to reduce energy capacity requirements from the electricity grid, and to promote energy independence...." And it states, "The CSU will endeavor to meet or exceed the State of California and California Public Utilities Commission Renewable Portfolio Standard (RPS) that sets a goal of procuring 20% of its electricity needs from renewable sources by 2010 subject to the constraints of program needs and standard budget parameters." The EO also sets goals and lists specific actions to achieve energy conservation, meet sustainable building practices, and achieve sustainable physical plant operation. A CSU-level Sustainability Advisory Committee was initiated to implement policy on energy conservation, sustainable building practices, and physical plant management. At the CSU-level, there is a strong commitment to addressing climate change by reducing greenhouse gasses, conserving energy and switching to renewable energy resources, green building, and waste reduction. For example, as a member of the Climple

# Recommendations for San Jose State University's Sustainability Policy

Purpose of a San Jose State University Sustainability Policy: Provide a framework that will allow San Jose State University to develop and implement short- and long-range actions, policies, and strategies to promote environmental sustainability in all facets of university teaching, research, planning, operations, and finance.

## Introduction

Universities have an obligation to ensure they operate sustainably and ensure their students are environmentally literate and understand their responsibilities in helping to create a sustainable society. Achieving these goals requires action at all levels of university administration and infrastructure and requires promoting sustainability literacy and action among all SJSU students as well as fostering academic research into achieving a sustainable society.

In this policy section, we recommend a number of general components to be included in a Sustainability Policy at San Jose State University that will result in setting, implementing, and assessing sustainability goals and actions SJSU. We also suggest a range of top-priority actions related to university operations, research, and academics that should be called out in SJSU's Sustainability Policy and implemented quickly at SJSU.

## Components of a Sustainability Policy at SJSU

This section identifies a number of general components that we recommend be included in San Jose State University's sustainability policy. We do not prioritize these elements as we view them all as essential, however, they may be implemented in a phased manner. The core of this policy is an organizational structure that will result in setting, implementing, and assessing sustainability goals, actions, and policies at SJSU. Points 1-5 describe this organizational structure. This structure is designed to promote intra-campus coordination and interdisciplinary collaboration. Only through such cooperative efforts can we be successful. The success of our endeavor is also dependent on a long-term and active commitment by the University administration, the Sustainability Council, and people at all levels of the University. Some aspects of campus sustainability will be achieved relatively quickly and easily, but others will take time and concerted effort; these can only be achieved through our persistent and dedicated commitment. The other points in this section describe general sustainability actions the University should undertake. These elements allow the University to develop goals, determine where sustainability actions are needed, and implement specific measures for achieving a sustainable university. We recommend these elements as a Sustainability Policy to be reviewed and ultimately passed by the Academic Senate to be implemented by the President.

1. Establish a Sustainability Council (Figure 1 and 2), as a permanent committee of the Academic Senate, comparable to a board of directors, charged with establishing sustainability goals, regularly evaluating campus actions to promote sustainability, and recommending new goals, actions and policies on a yearly basis. This Council will regularly review our progress toward sustainability goals. This Council will report to the University President. Members will include representatives from each college and all other major administrative and auxiliary units at SJSU. Faculty members will use this committee as part of their service commitment; members from other units will have this committee work integrated into their work plans.

2. Fund a full-time Sustainability Director (Figure 1 and 2), comparable to an executive director, who is well-connected within the University to oversee the implementation of sustainability directives and who seeks funding for sustainability initiatives. The Sustainability Director will be develop action plans, timelines, and methods to implement and assess sustainability mandates. The Sustainability Director will report to the Office of the President. The Sustainability Director will also provide single-point-of-contact to connect university to external partners and stakeholders (e.g. City of San Jose Green Vision staff) in order to facilitate timely communication, linkages of expert resources and effective action across campus community. One staff position is required to support the Sustainability Director. The University will commit to funding these positions; however, over time, these positions are expected to be funded partially or entirely through savings resulting from sustainability actions and from grants.
3. Establish a Faculty-In-Residence program for all Colleges, and a parallel position in all other SJSU units (Figure 1 and 2), charged with informing all members of the faculty and staff of SJSU's sustainability goals, promoting action to meet those goals, and reporting to the Sustainability Director on progress toward meeting sustaina

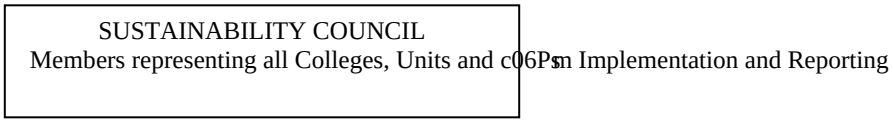



FIGURE 1. Organizational Structure for Sustainability Program Implementation and Reporting

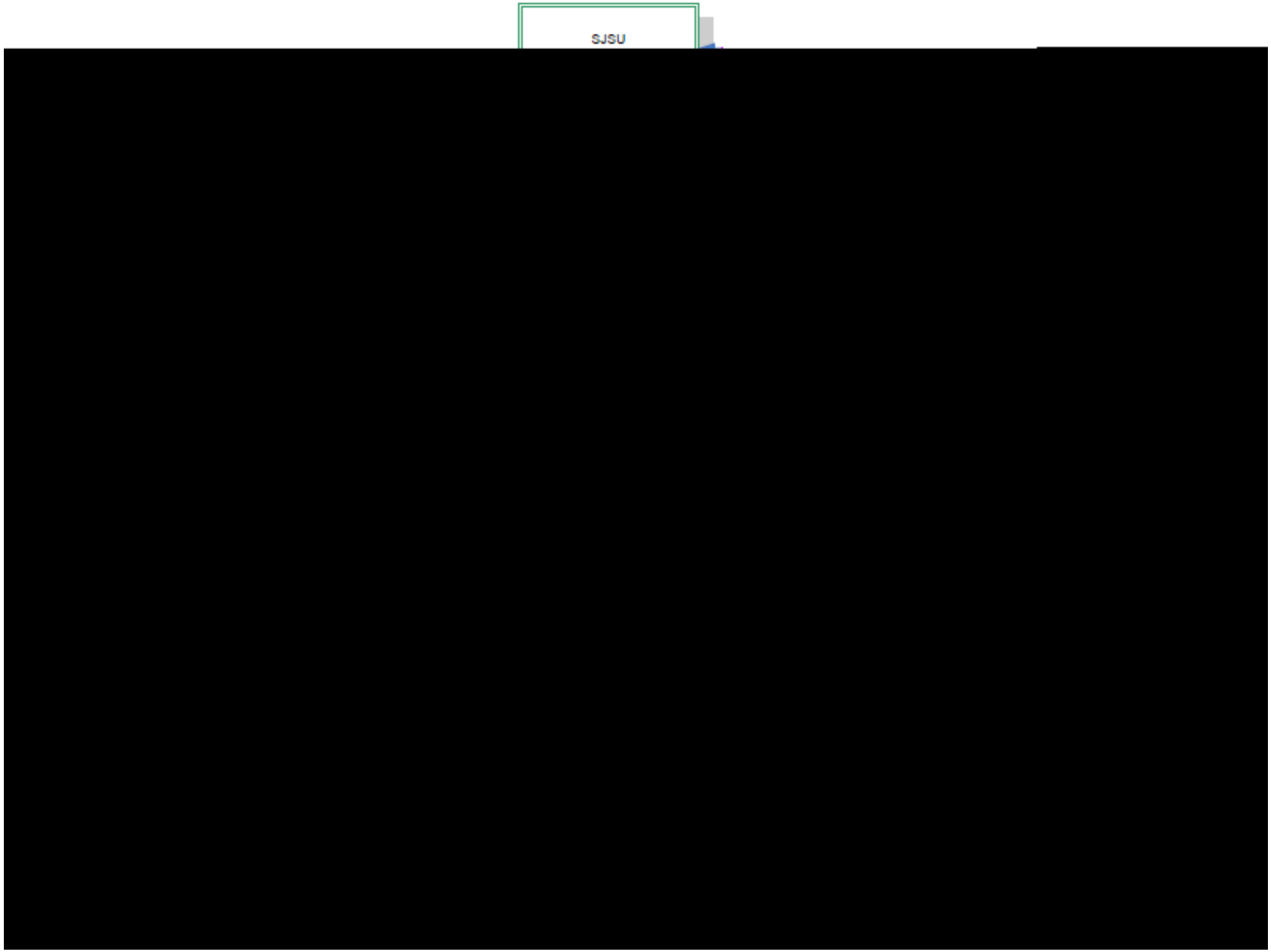



FIGURE 2. Integration of Sustainability Organizational Structure at SJSU

6. Regularly conduct environmental audits of University operations to assess sustainability of energy and materials use and to provide direction for new sustainability actions. The Sustainability Committee will set the timeframe for audits and ensure a review of the audit

Student, Faculty and Staff Awareness/Behavioral Change

1. Ensure the availability of organic and/or locally grown food on campus for students and the entire campus community.
2. Support and promote organic gardens on campus for food and hands-on learning.
3. Promote the use of non-personal car transportation modes, including developing bike-oriented infrastructure including bike lanes, bike parking, and an on-campus bike co-op, and encouraging students, faculty and staff to utilize mass transit options promoted by Transportation Solutions. Transportation Solutions, which functions under the auxiliary organization AS, won a 2009 Clean Air Award from Breathe California.
4. Reduce solid waste generation on campus, especially throw-away items such as plastic utensils, polystyrene containers, bags, and one-use plastic water bottles.
5. Require students, faculty and staff take an on-line tutorial on promoting sustainability before they receive specific privileges such as parking passes.
6. Promote the use of previously used paper, use both sides of paper, and move to paperless communication whenever possible.
7. Establish annual sustainability awards for faculty, staff and students who will be honored at existing events such as Service Recognition Ceremony and the Honors Convocation.
8. Use MLK Library as a central location for sustainability talks and information for the campus and the community.
9. Recognize sustainability projects, research, curriculum development and awards as activities that benefit faculty in the RTP process.
10. Include readings with sustainability as a theme in the campus reading program.

Procurement

1. Enforce and expand Environmental Procurement Procedures.
2. Eliminate the use of virgin paper through measures such as procurement of 100% only post-consumer recycled content paper, promoting use of both sides of paper, and going to paperless methods as often as possible.
3. Establish and enforce sustainability guidelines for purchase of consumables and equipment.

Curriculum and Research

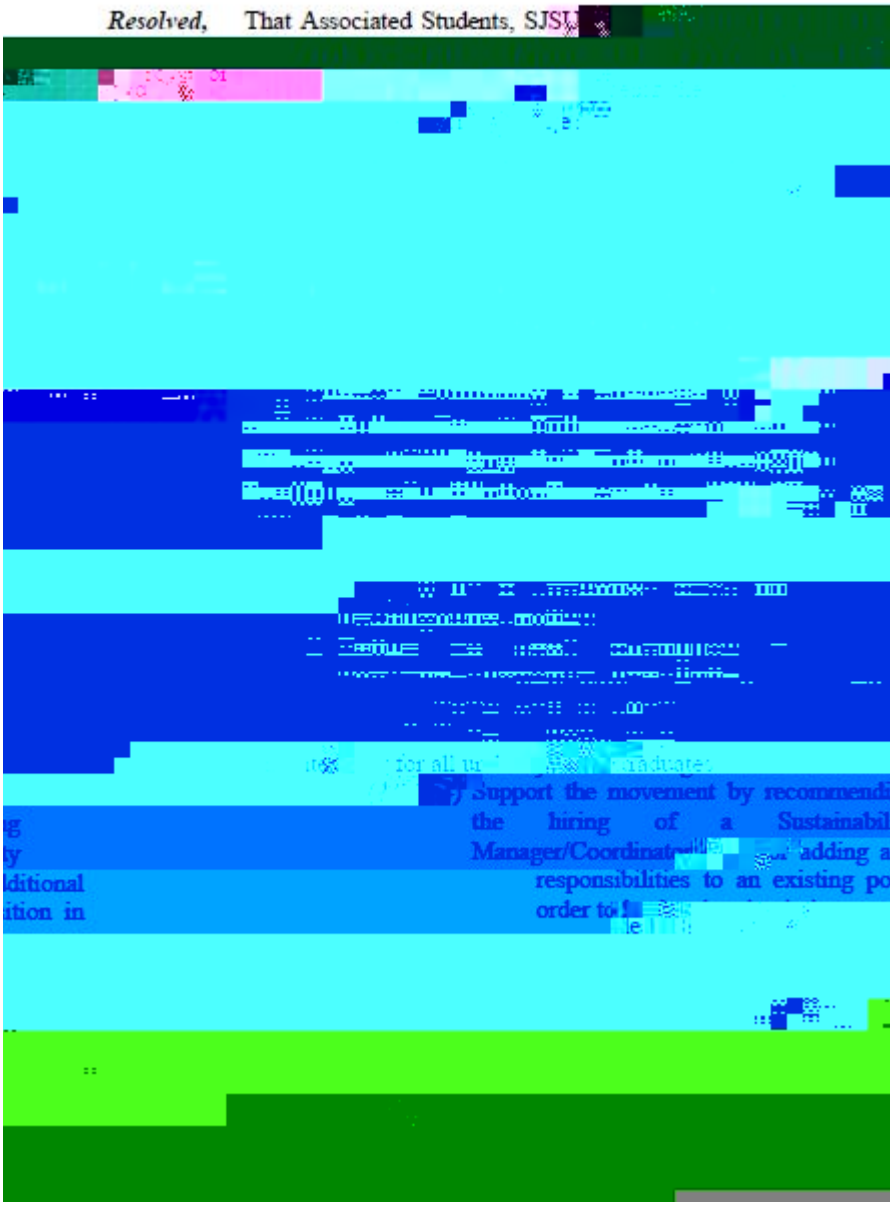
1. Identify and promote strategic, interdisciplinary, multiyear research and project grants for sustainability.
2. Where appropriate, promote on-line classes and other modes of teaching that do not require travel to campus, as well as telecommuting, when appropriate. SJSU has a Telecommuting Policy (Human Resources, February 12, 2009) that provides guidelines for supporting telecommuting when it is the best interest of employees and sustainability.

3. Develop joint projects and programs with other community colleges and K-12 educators.
4. Identify and promote service learning and internship opportunities that address regional sustainability issues.
5. Secure funding for scholarships for students in sustainability-focused degrees and programs.

## APPENDIX 1. Creation of a New Sustainability Research Institute at SJSU

The Task Force recommends that the establishment of the Institute be a major priority for the Sustainability Faculty in Residence during the 2009-2010 academic year. Financially, the short-term goal for the Institute would be economic self-sufficiency within three to five years of inception. Organizationally, the Director of the Institute could report to two main Deans, similar to the reporting

## APPENDIX 2. Associated Students Resolution


Resolved, That Associated Students, SJSU
for all u
Support the movement by recommendi
the hiring of a Sustainabil
Manager/Coordinat
adding a
responsibilities to an existing po
order to
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ition in

***Resolved***, That Associated Students will make this document

Academic Senate, San Jose State President Jon Whitmore, the San Jose City Council, San Jose Mayor

Associated Students Managers.

*Rationale*, *Accomplishing these goals will contribute to a more*

*University's overall carbon footprint.*

Respectfully submitted by:

Sarah Bronstein, Director of Community and Environmental Affairs

William Cavu-Litman, A.S. President

Albert Hsieh, A.S. Vice President

**Passed and Adopted by the Associated Students of San José State Universi**

13-Yea 0-Nay 0-Absenti

0-Absent

Date

Albert Hsieh, Vice President and Chair

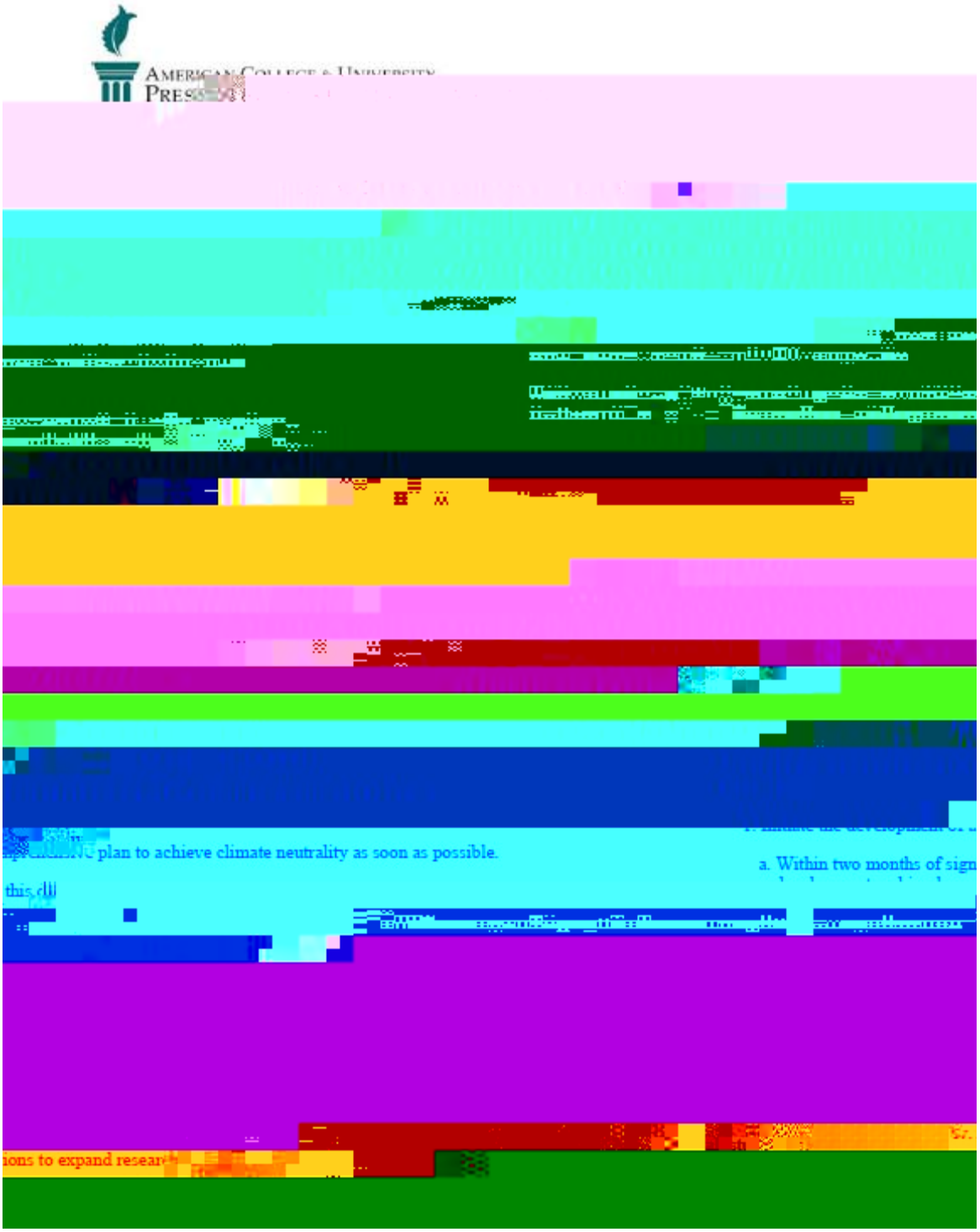
## APPENDIX 3. Talloires Declaration: University Presidents for a Sustainable Future

The University Leaders for a Sustainable Future (2001) make this statement about the Talloires Declaration: "Composed in 1990 at an international conference in Talloires, France, this is the first official statement made by university administrators of a commitment to environmental sustainability in higher education. The Talloires Declaration (TD) is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. It has been signed by over 350 university presidents and chancellors in over 40 countries."

The ten-point plan is as follows:

1. Use every opportunity to raise public, government, industry, foundation, and university awareness by publicly addressing the urgent need to move toward an environmentally sustainable future.
2. Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward a sustainable future.
3. Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and responsible citizens.
4. Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional school students.
5. Set an example of environmental responsibility by establishing programs of resource conserf

## APPENDIX 4. American College & University Presidents Climate Commitment




2. Initiat
certified products in all areas for which su
gs exist.
c. Establish a policy of offsetting all greenhouse gas emissions generated by air tra
ow
tion.
uid for by
d. Encourage use of and provide access to public transportation for all facu
visitors at our institution.
, staff, stu
s and
e. Within one year of signing this document, begi
institution's electricity consumption from renewable s
ing or producing at least 15% of our
rces.
f. Establish a policy or a committee that supports climat
companies where our institution's endowment
ility shareholder proposals at
nvested.
g. Participate in the Waste M
c/o Secon

# APPENDIX 5. Sustainability Awareness at SJSU

## I. Subcommittee goals:

We have compiled information and made recommendations regarding sustainability awareness on the campus of San Jose State. Our definition of awareness includes both being aware of sustainability-related programs on campus as well as being aware of how individual behavior contributes to sustainability. The three areas of sustainability on which we focused were: waste, energy use, and transportation. We compiled available information on the current state of awareness at SJSU. We also gathered information on methods at other campuses that increase awareness in order to identify areas in which sustainability awareness at SJSU can be improved and to make specific recommendations on actions that can be put in place on campus.

## II. Current state of awareness at SJSU

### A. Student, faculty, and staff survey results

Survey conducted by Megan Fluke, Environmental Studies student, on the state of sustainability on campus in 2008

As a part of a course project for ENVS 198, a student surveyed nine students, faculty, and staff with regards to their opinions of sustainability on campus.

Respondents were asked whether they were aware of any CSU or University-wide policies regarding sustainability. Of the nine surveyed, only two were aware of specific policies. When asked how easily interested persons could access information about sustainability on campus, most respondents indicated they felt the ease of access ranged from difficult to moderate. Also, when asked to rank sustainability effort coordination on campus from completely decentralized to completely centralized, nearly all respondents felt it was completely decentralized. While most acknowledged there was some effort to initiate sustainability activities on campus, there appears to be no coordination among parties involved (*e.g.*, between students and staff). In a related set of responses, when asked to numerically rate the interest and involvement of students, faculty, staff, and administrators in sustainability activities, each group generally ranked themselves highest (*e.g.*, staff thought staff were most involved, students thought students were most involved). Yet none of the respondents ranked any group's level of involvement or interest as highly involved.

Conclusions: Awareness of sustainability activities on campus is poor. While some efforts are underway, there is little knowledge of them outside of those people directly involved. Coordination among groups or activities is poor.

### B. Transportation survey results

Survey conducted by Eyedin Zonobi, Manager of Transportation Solutions, Fall 2008

Transportation Solutions (TS) conducts annual student surveys on awareness of TS services and use of different modes of transportation. The SJSU TS services is a leader among CSU campuses in making alternative transportation accessible to students. In 1994, an EcoPass

became available to all SJSU students, as paid for by student fees. This pass enables them to ride Santa Clara Valley public transportation for free and was initiated to reduce pressure on the limited parking resources on campus. After ~7 years, it became clear that students were not yet aware of this pass, so TS was founded. It is currently a self-sustaining program that coordinates access to public transportation, carpooling, and other transportation-related topics.

In 2008, there were 4075 respondents to the survey. Of those, ~90% had heard of TS. The use of alternative modes of transportation in 2008 was ~50% greater than in 2001, while the percent of those who drove alone declined by more than 25% over that same time period. The top reasons students gave for using alternative modes of transportation were 1) the availability of the EcoPass or other Transportation Solutions services, 2) to avoid traffic and parking hassles, 3) to avoid paying for parking, 4) to avoid paying for gas, and 5) because it is good for the environment. Only 4% of students who responded said they used alternative modes of transportation due to awareness of "Spare the Air" days. Of those respondents aware of "Spare the Air" days, more than 2/3 chose to drive their cars even when a "Spare the Air" day was called.

There were a variety of ways in which students had been made aware of the EcoPass and other Transportation Solutions services. The most common sources for information were 1) a mailed brochure, 2) student orientation, and 3) friends. Once students learned of TS services (such as the EcoPass), 53% made use of them by taking the bus or light rail, while previously, only 14% had.

Conclusions: Students do use alternative modes of transportation, but primarily for financial reasons and not for environmental reasons. However, the availability of the various TS services

- Campus lighting audits:  Training auditors to take light meter readings and identify

- Á Create faculty-in-residence for sustainability to create awareness among existing faculty (low cost)
- Á Increase training and access to paper-less course instruction (especially to for the less

# APPENDIX 6. Infusing Sustainability Across the Curriculum: Implementing a Faculty Development Program at SJSU

***Objective:***

To provide a rationale for the implementation of a faculty development program (FDP) at SJSU that encourages faculty in all disciplines to infuse sustainability into their curriculum.

***Rationale:***

A key mission of universities is to train students to understand and respond to the ever-changing problems society faces, including the particularly daunting task of addressing the global environmental crisis. From math to music, engineering to English, sustainability is an issue that cuts across the disciplines. However, according to Camblin & Steger (2000), it is unrealistic to assume that faculty can integrate sustainability and/or environmental issues into their curriculum solely through self-education. Recognizing that faculty are the experts in their own disciplinary specialization, the purpose of a Sustainability Across the Curriculum FDP is not to *teach* faculty about sustainability, but to encourage them to explore different means they can *engage with students* through their curriculum on these complex, interdisciplinary issues through a structured learning community. Some examples from a FDP at Emory University include (Bartlett & Rappaport, forthcoming):

- In Anthropology, taking an anthropological approach to sustainable fisheries in Central America
- In English, critiquing, reading, writing poems that focus on nature
- In Journalism, researching and writing a news piece on toxic contamination in Alabama
- In Music, a course that focuses on music and social politics
- (see, e.g. www.cliftoncommunitypartnership.org/uploads/documents/2009/02/20090206091936 43/Sustainability20Courses.pdf for a wide range of courses at Emory that incorporate sustainability into the curriculum)

***Benefits:***

The benefits of a FDP focused on sustainability reaches far beyond the obvious impact on students and faculty in the classroom. According to a forthcoming article by Bartlett and Rappaport, this type of FDP influences teaching, research innovation, interdisciplinary dialogue, as well as quality of life, and has a long-lasting impact on both faculty participants and the greater university community.

**Teaching:**

- Participation in a FDP typically results in changing multiple courses (beyond the minimum required as a participant in the FDP) resulting in significant impact on students at the university;
- A range of pedagogical innovations are implemented including new course readings, new course modules, new assignments, or a completely new paradigm for teaching the course;
- FDP participants are more likely to encourage students to become involved in their community.

**Research and Scholarship:**

- FDP typically focus on curricular changes, yet significant percentages of faculty surveyed by Bartlett and Rappaport report that their research activities are positively influenced by the program;
- According to FDP participants, they are more likely to engage in interdisciplinary research (and teaching) and seek to engage in interdisciplinary collaborations with faculty across the university;
- Participants report a much greater connection to the university community.

**Personal Action:**

- FDP participants report that they are more aware of environmental and sustainability issues and have personally changed their behavior both at the office (e.g. environmentally-preferred purchasing, reduced energy use, increase in walking to work) and at home (e.g. reduced water use, more sustainably-sourced meals, changed incandescent to fluorescent bulbs, etc.);
- Participants indicate that they have a much stronger connection to the living ecosystem around them.

***Example of Sustainability Across the Curriculum Faculty Development Program***

Universities across North America have implemented Sustainability Across the Curriculum FDPs over the past several years, including Penn State, the University of British Columbia, Tufts University, Evergreen College, and many others. Examples of particularly well-known and well-documented programs are those at Tufts (Environmental Literacy Institute, an EPA and corporate grant-funded program that ran from 1990-1995), Northern Arizona University (the Ponderosa Project directed by Dr. Geoff Chase, who is currently Dean of Undergraduate Studies at San Diego State University), and Emory University (the Piedmont Project, spear-headed by Dr. Peggy Bartlett in 2002). The points below summarize the approach taken at Emory, which is adapted from Northern Arizona University's FDP.

- Faculty from a wide range of disciplines apply to join a 20-member faculty cohort
- A 2-day workshop during the Spring semester brings the cohort together to stimulate interest, ideas, and innovation as to how to infuse sustainability into their curriculum
- Cohort members spend time during the summer revising their curriculum based on ideas generated during the workshop for at least one-course
- Cohort members gather for a 1-day meeting in August to share and discuss their work
- Upon completion of a revised syllabus, cohort members receive a $1,000 stipend
- Financial resources required for program:
    - Stipends for cohort members: $1,000 x 20 = $20,000
    - Course release and/or stipend for workshop coordinators (1-2 faculty members): varies

# APPENDIX 7.
# Sustainability in the SJSU Curriculum: Degrees, Minors, and Courses

This list of courses and programs was compiled by a team lead by Rona Haluilani and was reviewed by the Sustainability Task Force. We have endeavored to be as complete and comprehensive as possible, but we recognize we may have missed included courses or even programs that have a partial or central focus in sustainability. We expect this list to evolve and change and welcome information that could improve it.

## College of Applied Arts and Sciences

**College-level**

157 Community Action/Community Service (partial)

**Department of Health Sciences**

HS 161 Epidemiology (partial)
HS 167 Biostatistics (partial)
HS 265 Environmental Health (central)
HS 266 Computational Public Health Statistics (partial)

**Department of Hospitality and Recreation Management**

HRTM 20 Sanitation and Environmental Issues in the Hospitality Industry (central)
HRTM 101 Multicultural Community and Global Issues (partial)
HRTM 103 Facility Planning and Design (partial)
HRTM 109 Ecology, Culture, and Responsible Recreation (Central)
HRTM 135 Management of Facilities and Areas (partial)
HRTM 156 Principles of Sustainable Travel and Tourism (Central)
HRTM 218 Tourism Planning and Development (partial)

**Department of Nutrition and Food Sciences**

NUFS 20 Sanitation and Environmental Issues in the Hospitality Industry (central)
NUFS 111 Food Service Production Management (partial)
NUFS 103 Food Processing and Packaging (partial)
NUFS 115 Issues in Food Toxicology (partial)
NUFS 117 Food Evaluation Techniques (partial)
NUFS 133 Food Processing and Packaging II (partial)
NUFS 139 Hunger and Environmental Nutrition (central)
NUFS 170 Packaging Development and Management (partial)

## College of Business

**Department of Organization and Management**

BUS 166 Business and Society (partial)
BUS/ENVS 167 Managing Environmental Issues (central)
BUS 168 Global Business and Human Rights (central)
BUS 187 Global Dimensions of Business (partiall)

## College of Education

**Department of Child Development**
CHAD 160 Child Development (Partial)

**Department of Elementary Education**
EDEL 108B Curriculum: Science (Central)

## College of Engineering

**Department of Civil and Environmental Engineering**

*Minor in Green Engineering*

**Courses**

| | |
|---|---|
| CE 112 | Mechanics of Materials (partial) |
| CE 121 | Transportation Engineering (partial) |
| CE 122 | Traffic Engineering (partial) |
| CD 123 | Highway and Street Design (partial) |
| CE 140 | Soil Mechanics (partial) |
| CE 150 | Water Resources Engineering (central) |
| CE 152 | Engineering Hydrology (partial) |
| CE 153 | Groundwater Flow and Transport (partial) |
| CE 170 | Principles of Environmental Engineering (central) |
| CE 173 | Engineering and the Environment (central) |
| CE 222 | Transportation Engineering planning |
| CE 224 | Traffic Operations (partial) |
| CE 226 | Topics in Transportation Engineering (partial) |
| CD 241 | Groundwater Seepage and Drainage Control (partial) |
| CE 242 | Experimental Soil Mechanics (partial) |
| CE 250 | Water Resources Engineering (partial) |
| CE 252 | Advanced Hydrology (partial) |
| CE 271 | Water Treatment and Plant Design (partial) |
| CE 272 | Wastewater treatment and plant design (central) |
| CE 274 | Industrial and Hazardous Waste Management and Treatment (central) |
| CE 275 | Biosolids and residual management engineering (partial) |
| CE 279 | Special Topics in Environmental Engineering (partial) |
| CE 281 | Physical Chemical Processes in Environmental Pollution Control (central) |
| CE 282 | Biological Processes in Environmental Pollution Control (central) |

**Department of Mechanical and Aerospace Engineering**
ME 198 Techology and Civilization (partial)

## College of Humanities and the Arts

**Department of Philosophy**
PHIL/ENVS 126: Environmental Ethics and Philosophy (central)

**School of Art and Design**
ArtH 072 Design in Society (Potential for integration with sustainability-related curriculum)
ArtH 192C History of Interior Design (Potential for integration with sustainability-related curriculum)
DSID 130 Sustainable Design (central)

Biol 164: Conservation Biology Techniques (major's course)
Biol 190/225E: Field course in Amazon Forest (Partial)
Bot 165 Plant Communities of California (Majors course) (Partial)
Ent 150 Biological Control (Majors course) (Partial)
Micro 122 Bacterial Diversity (Majors Course) (Partial)

**Department of Chemistry**
CHEM 212 Natural Products. (Partial)

**Department of Geology**
GEOL 003/10 Planet Earth (General Education) (Central)
GEOL 171 The End of the World (as you know it) (Central)
GEOL/ENVS111 Earth Systems and the Environment (GE – Area R) (Central)
GEOL 105 General Oceanography (GE Area R) (Partial)
GEOL 108 Water, Ecosystems, and Society (Majors Course) (Central)
GEOL 112 Hazards, Risks of Earthquakes and Volcanoes (Majors Course) (Partial)
GEOL/HUM/COMM/ENVS/MET 168: Global Climate Change (9 units) (Central)

**Marine Science Program**
MS 143 Chemical Oceanography (Partial)
MS 144 Biological Oceanography (Partial)

**Department of Meteorology**

*Joint Minor with Environmental Studies in Climate Change Solutions*

**Courses**
METR 10 Weather and Climate (GE B1) (Central)
METR 112 Global Climate Change (GE Area R) (Central)
METR/ENVS 113: Atmospheric Pollution (GE Area R) (Central)
METR 131 Air Pollution Meteorology (Majors Course) (Central)
METR/GEOL/HUM/COMM/ENVS/ 168: Global Climate Change (9 units) (Central)

**College of Social Sciences**

**Department of Communications Studies**
COMM/ENVS 146: Communication and the Environment

**Department of Environmental Studies**

*BS, with a Minor or with Concentration in Energy, Environmental Impact Assessment, or Environmental Restoration and Resource Management*

*BA, with a Minor or BA, Teacher Preparation*

*Minors in Environmental Studies, Energy Policy and Green Building, or Park Ranger Administration*

*Joint Minor with Meteorology in Climate Change Solutions*

**Courses**

ENVS 001 Introduction to Environmental Issues (Central)
ENVS 010 Life on a Changing Planet (Central)
ENVS 100W Environmental Research and Writing (Central)
ENVS 105 Environmental Change and Problems, San Francisco Bay Area (Central)
ENVS/ECON 107: Introduction to Environmental Economics and Policy (Central)
ENVS 110 Resource Analysis (Central)
ENVS/BIOL 112: Hazardous Waste (Central)
ENVS 116 Solar Energy Theory and Applications (Central)
ENVS 117 Human Ecology (Central)
ENVS 118 Gardens, Culture and Environment (Central)
ENVS 119 Energy and the Environment (Central)
ENVS 124 Introduction to Environmental Law (Central)
ENVS 125 Advanced Environmental Law (Central)
ENVS 128 Water Resource Management (Central)
ENVS 129 Water Policy in the Western U.S.
ENVS 130 Energy Policy Analysis (Central)
ENVS 132 Solar Home Design (Central)
ENVS 133 Alternative Energy Strategies (Central)
ENVS/POLS 135: U.S. Environmental Policy (Central)
ENVS 140 Politics and the Environment (Central)
ENVS 144 California Environmental Controversies
ENVS 148 Recycling and Resource Management (Central)
ENVS/AFAM: 151: Race, Poverty and the Environment (Central)
ENVS/PKG 152: Environmental Issues and Global Distribution of Goods (Central)
ENVS 154 Sustainable Agriculture (Central)
ENVS 158 Environmental Education (Central)
ENVS/GEOG 165: National Parks (Central)
ENVS 166 Nature and Conservation Photography (Central)
ENVS/GEOL/HUM/COMM//MET 168: Global Climate Change (9 units) (Central)
ENVS 170 Introduction to Environmental Health and Safety (Central)
ENVS 181 Environmental Resource Center (Central)
ENVS 185 Environmental Impact Analysis (Central)
ENVS 187 Environmental Restoration (Central)
ENVS 189 Coastal Field Studies (Central)
ENVS 190 Advanced Environmental Impact Assessment (Central)
ENVS 191 Advanced Environmental Restoration (Central)
ENVS 193 Supervised Projects and Research (Central)
ENVS 194 Environmental Internship (Central)
ENVS 195 Instructor Assistant in Environmental Studies (Central)

**Department of Geography**
GEOG/ENVS 121 Population and Global Change (Central)

**Department of Economics**
ECON/ENVS 108: Benefit Cost Analysis (Partial)

**Department of Urban Planning**
URBP/ENVS 123 Historic Preservation and Neighborhood Revival (Partial)
URBP/ENVS 134 Topics in Historic Preservation (Partial)
URBP/ENVS 136 Introduction to Land Use and Facilities Planning (Partial)
URBP/ENVS 142 Introduction to Environmental Planning (Central)
URBP/ENVS 169 Introduction to Computers in Planning (Partial)

**APPENDIX 4. Approved Courses**

| Course Number | Title | Unit | Contact Person | Central/ Partial** | Core GE or SJSU Studies |
|---|---|---|---|---|---|
| AMS/ENVS/HUM 159 | Nature and World Cultures | COHA | Scott Guenter, Coordinator | central | SJSU Studies |
| CASA/COB/ED/ENG/HA/COS/COSS | Climate Solutions | COE | Pat Backer COE | Central | Core |
| BIOL 010 | The Living World | COS | John Boothby, Chair | partial | Core |
| BIOL 020 | Ecological Biology | COS | John Boothby, Chair | central | Core |
| COMM/ENVS/GEOL/HUM/METR 168/168W | Global Climate Change | COSS | Dennis Jaehne, Chair & Lynne Trulio, Chair | central | SJSU Studies |
| ENVS 001 | Introduction to Environmental Issues | COSS | Lynne Trulio, Chair | central | Core |
| ENVS 010 | Life on a Changing Planet | COSS | Lynne Trulio, Chair | central | Core |
| ENVS 100W | Environmental Research and Writing | COSS | Lynne Trulio, Chair | central | SJSU Studies |
| ENVS 152 | Environmental Issues and the Global Distribution of goods | COSS | Lynne Trulio, Chair | central | SJSU Studies |
| GEOL/ENVS 111 | Geology and the Environment | COS | Richard Sedlock, Chair | central | SJSU Studies |
| METR 112 | Global Climate Change | COS | Alison Bridger, Chair | central | SJSU Studies |
| METR/ENVS 113 | Atmospheric Pollution | COS | Alison Bridger, Chair | central | SJSU Studies |
| NUFS 115 | Issues in Food Toxicology | CASA | Lucy McProud, Chair | partial | SJSU Studies |
| NUFS 139 | Hunger and Environmental Nutrition | CASA | Lucy McProud, Chair | partial | SJSU Studies |
| PHIL/BUS/JS 186 | Professional and Business Ethics | Studies | Chair | partial | SJSU |

## APPENDIX 9. Sustainability and Cost Saving Measures

The measures listed below help protect the planet and save the campus money at the same time. The measures are divided into three groups from the easiest and least capital intensive to achieve the more difficult and/or costly to initiate.

### Small Scale Effort

- Establish a No Smoking policy on campus – eliminates cigarette butt litter and saves money on clean up.

- Recycle coffee grounds to use on plants – avoids the cost of waste removal and reduces purchase costs of fertilizer.

- Embrace telecommuting, e-learning, blackboard, turn-it-in, conference calls, e-meetings -- not only do employees and students save by not having to commute to campus, the campus does not have to have as many buildings and saves on not having to condition existing space.

- Establish a deposit on plastic bags – reduces trash pickup and waste hauling costs.

- Institute campus-wide computer power saving settings – the cost of resources to oversee and coach users in implementing these settings can be offset by savings in energy.

- Work with Procurement to enforce and expand green purchasing practices campus-wide -- as the demand for green products increases, the price of green products will decrease.

- Identify and purchase copiers, printers, computers/monitors with performance standards greater than Energy Star standards The total-cost-of-ownership will be less if highly efficient equipment is purchased.

- Establish campus policy to use email as a means of disseminating announcements rather than using flyers -- saves cost of paper and waste hauling.

- Decrease parking rates further for motorcycles and hybrids - motorcycle parking takes up less space than car parking, freeing up resources.

- Establish a prominent link to the campus sustainability web site from the SJSU home page to provide greater visibility. The webpage should be maintained by the newly established office of the Sustainability Director and will eliminate duplication of effort, which is a waste of our time and resources.

- Ensure that the Climate Solutions Initiative and Global Climate Change courses remain permanent; expand GE courses relating to sustainability -- sustainability classes make our graduates more valuable in the workforce and are a good investment in California’s future.

- Incorporate sustainability into all classes

- Make basic sustainability literacy a graduation requirement

- Maintain a campus sustainability committee

## Mid-Scale Effort

- Take Back the Tap/Lug-a-Mug –
- Remove bottled water vending machines on campus
    - Awareness campaign: Publicize the drinkability of campus water (post signs pointing to test results web site); discuss the impacts of disposable beverage containers.
    - Install pay for fill stations next to existing fountains, run by Spartan shops or turn existing fountains into fill stations.
    - Decrease purchased water deliveries to campus. Lack of confidence in tap water has lead to extensive purchases of delivered water. Save money and energy by having procurement establish a policy of requiring justification for water coolers in offices that have tap water readily available.

- Install Smartboards in the classrooms so faculty can distribute electronic notes and therefore decrease the use of paper probably would need to id a source of revenue for this. The energy and resources required to build and run smart boards may have a higher carbon footprint than the paper that would be saved.

- Investigate ways to avoid throwing away reusable furniture
    - Provide means for reusable furniture to find a new home on campus
    - Standardize on one brand/style for all new purchases of system furniture so that parts are interchangeable and reconfigurable
    - Donate unwanted furniture to other public entrb/TT2 1 Tf0ible.

- Partner with City of San Jose and Valley businesses to leverage use of green technologies on campus
    - Establish SJSU Institute of Sustainability
    - Expand campus bike program – add more cages

- Sign the President's Climate Commitment and the Talloires Declaration.

- Reduce cars from campus by encouraging ride sharing, making campus more bike friendly.

## Large Scale Efforts

- Create Campus Sustainability Officer position - if efforts in conservation, such as residence hall and office audits save money, this could be close to self-funded.

- Use recycled water for irrigation across campus and for use in urinals/toilets in King Library and all newly constructed buildings on campus.

- Create campus site for experimenting with clean energy design, construction, operations and management – like teaching hospitals for med students possibly grant funded?

- Install individual metering systems for campus buildings to determine where conservation efforts are succeeding or failing -- providing feedback to building occupants helps them know when their conservation efforts are paying off, and thus can lead to conservation practices becoming institutionalized.

- Install alternative energy facilities across campus; expand facilities on roof of Engineering

# Appendix 10. Faculty and their Sustainability-related Research

## College of Applied Sciences and Arts

**Department of Hospitality and Recreation Management**
Dr. Suzy Ross: sustainable recreation and travel.

**Department of Justice Studies**
Dr. Steven Lee: environmentally friendly storage of DNA samples.

**Department of Kinesiology**
Dr. Jay Johnson: impact of climatic change on human physical experiences.

**Department of Nutrition and Food Sciences**
Marjorie Freedman: food, nutritional awareness on campus, sustainable agriculture, use of locally grown foods, reduction of food waste, vermiculture.

Ashwini Wagle: consumer acceptance of bio based disposable food wares, hunger and environmental nutrition.

## College of Engineering

**Materials and Chemical Engineering**
Guna Selvadury: disaster mitigation and preparedness.

**Department of Civil and Environmental Engineering**
Udeme J. Ndon: environmental biotechnology, treatment of wastewaters, hazardous compounds, bioremediation.

Jan Botha: Transportation engineering, airport planning and energy efficient roadway design.

Kurt McMullin: response of structures to earthquakes and other catastrophic events.

**Department of Industrial and Systems Engineering**

Yasser Dessouky: calculating the carbon footprint of the supply chain for the semiconductor industry, modeling efficient transportation design.

Jacob Tsao: automated transportation, modeling of efficient cargo transportation

**Department of Mechanical and Aerospace Engineering**
Pat Backer: green technology.

Lili He: novel refracting concentration solar system.

Tai-Ran Hsu, Nicole Okamoto, Jinny Rhee, Raymond Yee, Jim Mokri: solar-mechaical engineering, including ZEM vehicle, cogenerating photovoltaic and thermal solar collector.

**Department of Meteorology**
John Abatzoglou: large scale atmospheric dynamics, impacts of climate change on weather patterns, fire weather

Robert Bornstein: urban weather and climatic change, modeling air quality,

Alison Bridger: atmospheric dynamics, numerical weather prediction

Craig Clements: micrometeorology – influences of fires, mountain boundary layers, and pollution on climate

Eugene Cordero: study of climate change, climate change public education, reduction of carbon footprints by use of locally grown foods.

Menglin Jin: computer analysis of satellite climate data. Effects of urbanization, cloud-aerosol interactions and other factors on local climates.

Mike Voss: synoptic meteorology, climate forecasting

**Moss Landing Marine Lab**
Gregory Cailliet – age studies of fish and implications for sustainable fisheries

Kenneth Coale – marine geochemistry – assays and biotic impact of trace metals in organisms and aquatic and terrestrial environments.

Jonathan Geller – impacts of biological invasions in marine invertebrate communities.

Michael Graham – roles of seaweeds, seagrasses and marsh plants in regulating marine communities. Environmentally mediated changes in the structure of marine communities.

Jim Harvey – vertebrate marine ecology, influences of human intervention and environmental change on marine vertebrate communities.

Nick Welschmeyer – environmental effects on phytoplankton and zooplankton communities, effects of invasive species.

**Department of Environmental Studies**
Katherine Kao Cushing: Water Resource Management, Environmental Certification Systems, Environmental Policy Implementation in China, Residential Street Livability, Sustainability in higher education institutions

Gary Klee: Coastal and Marine Sanctuary Management; Human Ecology (Emphasis Traditional Systems of Natural Resource Management); International Development (e.g., Peace Corps); Gardens, Culture and the Environment; Nature and Conservation Photography.

Heather Larson: residential energy design and building codes.

Bruce Olszewski: Integrated Waste Management, Materials Conservation (Recycling), Urban Water Conservation, and Environmental Policy.

Rachel O'Malley: Insect Ecology and Conservation; Sustainable Agriculture and Development; Environmental Impact Assessment; Restoration Ecology; Environmental Justice; Statistics and Modeling

Jeannine M. Pfeiffer: Ethnoecology, biocultural diversity conservation, traditional ecological knowledge, indigenous resource management, community-based & participatory action research.

Will Russell: Forest Conservation and Restoration, Fire Ecology, Coastal Dune Ecology, and Environmental Education.

Lynne Trulio: Conservation of Rare Species, especially Burrowing Owls; Environmental Restoration; Wetlands Ecology; Recreational and Management Impacts on Wildlife; Mitigation Development and Monitoring; Adaptive Management of Restoration Programs.

**Department of Sociology**
Scott Meyers-Lipton: Gulf coast civic works act- political, social, and environmental aspects of recent Gulf Coast disasters and their aftermath.

Dan Brook: Interest in research on vegetarianism and associated environmental and health benefits (http://www.brook.com/veg/

**San Jose State University Research Foundation**
**SJSU Sustainabilty Research Initiatives 2007 to Current**

| Program / Project Name Title | Faculty-Lead Investigator-PI | Department | Focus Area | Collaborators / Department(s) Involved | Sponsor | Funding | T |
|---|---|---|---|---|---|---|---|
| Studying Global and Regional Land Surface Skin Temperature Change Using Satellite Observations and Climate Modeling | Menglin Jin | Meteorology | Climate Change | NA | National Science Foundation | $152,505 | ( |

| AGENCY/SPONSOR | PROGRAM TITLE | NOTES/PROJECT EXAMPLES | FUNDING LEVELS |
|---|---|---|---|
| | Geography and Regional Science | Supports research on geographic distributions & interactions of human, physical, & biotic systems on Earth's surface. Investigations on nature, causes, & consequences of human activity & natural environmental processes across a range of scales are encouraged | |
| **Environmental Protection Agency** | Environmental Education Initiatives | Key areas: Career Development, Capacity Building, Education Reform, Teaching Skills, Environmental Stewardship | $50-200k plus |
| | STAR Research Grants | Supports environmental research by academic institutions, nonprofits, and state & local governments. Current programs: Integrated Design, Modeling, and Monitoring of Geologic Sequestration of Anthropogenic Carbon Dioxide to Safeguard Sources of Drinking Water (last deadline 1/6/09); Computational Toxicology Research Centers (last deadline 1/29/09); Novel Approaches to Improving Air Pollution Emissions Information | Undergraduate and Graduate Fellowships up to $50,000 annually |
| **US Dept of Agriculture** | Higher Education Challenge Grants | Program seeks to establish sustainable urban and community forests by encouraging communities of all sizes to manage and protect their natural resources. Projects fall under the following categories: Innovative urban and community forestry for minority and underserved populations | TBD |
| | AFRI: Plant Biology | Seeks projects that will provide fundamental knowledge for improvement and sustainability of agricultural plant and forestry production. Topic areas are Environmental Stress (1/30/09), Biochemistry (2/20/09), Growth and Development (3/02/09) | Approximately $12.25 million will be available in FY 09 |
| | Scientific Cooperation Research Program | Supports long-term & short-term international collaborative research & exchange activities that promote domestic & global food security, sustainable agriculture & resource management, & trade. Projects make practical use of science to help solve mutual agricultural problems | TBD |
| | P3 Award: A Student Design Competition for Sustainability | Supports undergraduate & graduate teams at IHEs to create partnerships with public/private sectors. Grants awarded to research, develop, & design sustainable solutions to environmental challenges. Interdisciplinary teams from multiple engineering departments &/or departments of chemistry, architecture, industrial design, business, economics, policy, social science, & others are encouraged | Up to $950,000 available to support approximately 50 Phase I awards and six Phase II awards |
| **US Dept of Interior** | Green Parks Program | Partnerships focused on "greening" national parks | TBD |
| **US Dept of Energy** | Photovolatic Univ/Industry Partnershps | Supporting unique university linkages to accerlate transformational technology and processes | $100k' s |
| | P3 Award: A Student Design Competition for Sustainability | Supports undergraduate & graduate teams at IHEs to create partnerships with public/private sectors. Grants awarded to research, develop, & design sustainable solutions to environmental challenges. Interdisciplinary teams from multiple engineering departments &/or departments of chemistry, architecture, industrial design, business, economics, policy, social science, & others are encouraged | In FY 09, up to $950,000 available to support approximately 50 Phase I awards and six Phase II awards |
| | STAR Research Grants | Current programs: Integrated Design, Modeling, and Monitoring of Geologic Sequestration of Anthropogenic Carbon Dioxide to Safeguard Sources of Drinking Water (last deadline 1/6/09); Computational Toxicology Research Centers (last deadline 1/29/09); Novel Approaches to | |

| | | |
|---|---|---|
| **Lindberg Foundation** | Balancing Nature/Technology through Research/Education | Funding research that creates a balance between technology & preservation of the natural environment. Interests: agriculture; aviation/aerospace; conservation of resources, including |