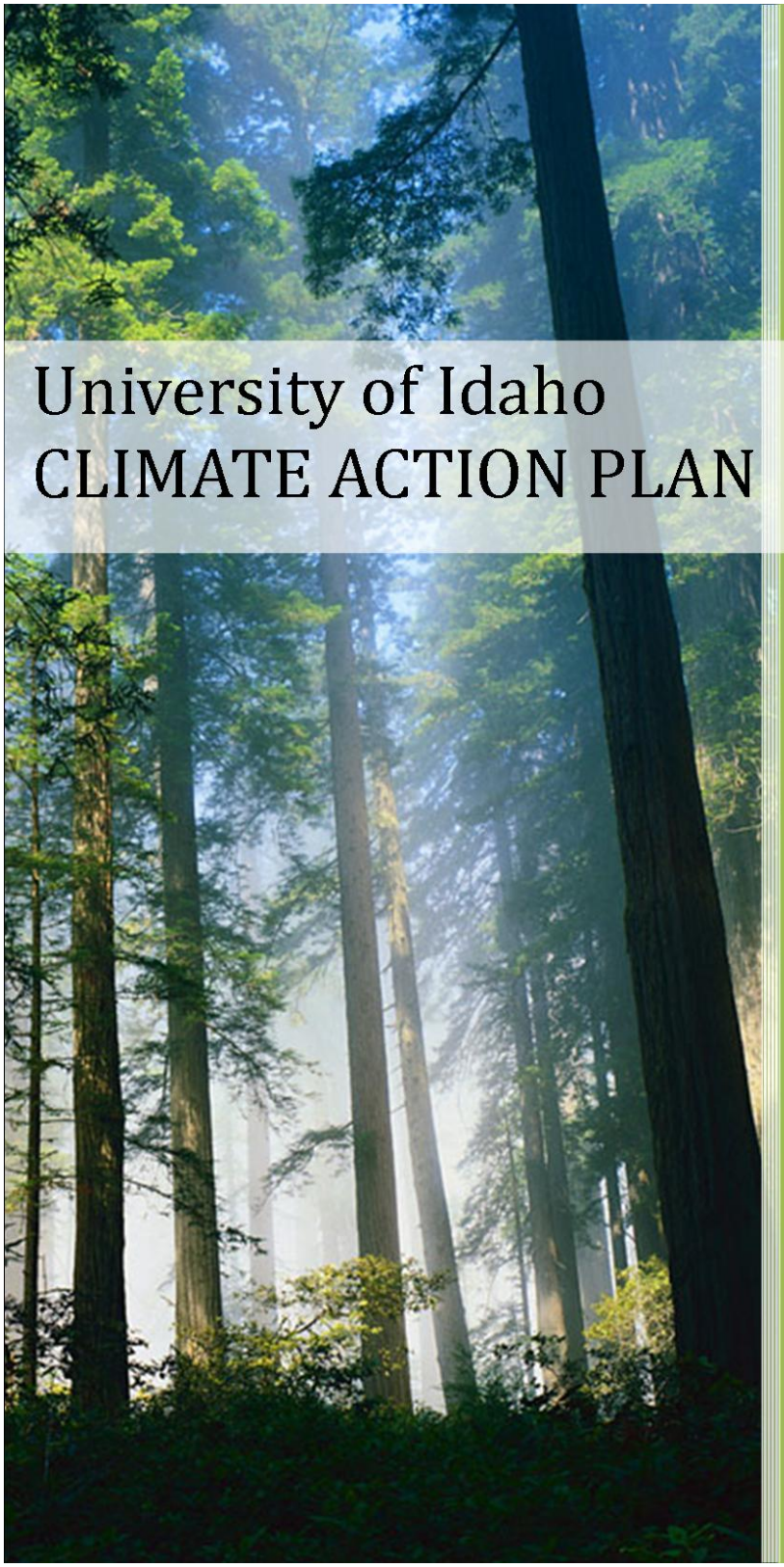

University of Idaho CLIMATE ACTION PLAN

2010

University of Idaho
Sustainability Center

January 15, 2010

University of Idaho
A LEGACY OF LEADING

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January 6, 2010

Dear Friends,

Climate change, with its long-range and pervasive effects, is a tremendous concern that we all face. While future generations may deal with this change in novel and insightful ways, it is up to our generation to initiate the social, economic and environmental efforts needed now to reduce the effects of climate change and mitigate its future impact.

Universities are uniquely poised to advance research surrounding climate change, to educate students who will become the leaders of those future generations and to model sustainable systems and practices -- in essence, to lead by example and foster the changes needed to address climate change.

Higher education also brings power to the challenge of climate change by developing feasible, scientifically based solutions; this can spell hope for the future when you think about higher education's ability to create a culture of change to help diverse global societies see things in new ways.

With the current level of CO_2 at nearly 388 ppm, we are rapidly getting close to the projected "tipping point" of 450 ppm. Once we get to this tipping point, the effects of sea-level rise due to the resulting global ice sheet melt and other climatologically-induced side effects will have dramatic effects which we have not yet fully realized. No doubt, we are already starting to see these effects in things such as changing weather patterns, increased drought, famine, habitat loss, animal migratory patterns, insect migration, species endangerment and extinction, polar ice melt, sea-level rise and the destruction of coral reefs.

If we take action now, we will have a greater chance to mitigate the impact of global climate change than if we take a 'business as usual' attitude. The University of Idaho is committed to blazing a path of action and serving as a model for other colleges and universities, and the rest of society, across the nation, and to demonstrating what it means to embrace sustainability. To that end, we are committed to achieve carbon-neutrality by 2030.

This report outlines the work that we already have underway toward our institution's carbon-neutral target. Through our vision and our commitment, we aim to curb climate change. Our efforts will draw our community --and our state -- closer together as collectively we work to attain carbon neutral status. I have confidence that the University of Idaho's students, staff and faculty-- along with cooperation from local industry, community stakeholders, and local government -- will be able to achieve this ambitious goal, as outlined in our Climate Action Plan.

Sincerely,

M. Duane Nellis

M. Duane Nellis,
President

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INTRODUCTION

This report is the first University of Idaho Climate Action Plan (CAP). The CAP was developed to outline the steps the University of Idaho needs to take to become climate neutral by 2030. The steps towards climate neutrality are also steps towards greater fiscal responsibility. Energy conservation, higher performance buildings, reducing fossil fuel use, and other strategies outlined in this plan are cost-effective, not only reducing our greenhouse gas emissions, but also reducing operational costs and the impacts of future increases in energy and fuel prices.

Part of the motivation for reducing the University's greenhouse gas emissions is to use our campus as a living laboratory. The challenges we face as a campus and university system striving to become carbon neutral provide excellent teaching and research opportunities. At the same time, teaching, research, and outreach provide valuable resources for efforts to address local, regional, and global-scale problems associated with climate change.

A number of the projects identified in this report involve the need for changes in staff, faculty, and student behaviors. We have a tendency to focus on technological solutions to problems, when small changes in behavior can result in significant financial savings and emissions reductions for the university. When we do not change management and personal behaviors we often undermine the effectiveness of technological improvements to our campus. Progress on many issues will require the broad participation of the campus community to be successful.

This report is intended to be a living document with regular updates. Like many long-term, large-scale institutional changes, the effort to become carbon neutral as a campus needs to proceed within an adaptive management framework. We need to continuously collect data on our efforts, evaluate success, and refine our operations based upon our experiences.

For more information about this plan and the University's efforts to reduce greenhouse gas emissions, please contact the University of Idaho Sustainability Center. www.uidaho.edu/sustainability

AMERICAN COLLEGES AND UNIVERSITIES PRESIDENTS CLIMATE COMMITMENT

In March 2007, the University of Idaho signed the American Colleges and Universities Presidents Climate Commitment (ACUPCC). As a signatory, the University committed to reduce its greenhouse gas (GHG) emissions significantly in the short-term, and to dramatically reduce GHG emissions and offset the remainder over the long-term. In addition to the long-term goal of climate neutrality, ACUPCC requires the following actions:

1. Develop a comprehensive plan to achieve climate neutrality as soon as possible. This climate action plan is the first iteration of that effort.

2. Initiate two or more tangible actions to reduce GHG emissions in the short-term while a more comprehensive plan is being developed. To meet this obligation, the University implemented the following actions:

    a. GREEN BUILDING POLICY: A policy requiring that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard was established in January 2008.

    b. WASTE MINIMIZATION: A number of efforts were initiated to minimize waste, including joining the national RecycleMania competition, developing tailgate recycling at football games and other sporting events, and expanding e-waste recycling on campus. Additional waste minimization activities are currently being developed as part of the President's Strategic Innovation Initiative and the University's Strategic Action Plan.

3. Make publicly available the University's Climate Action Plan and GHG inventory, including periodic progress reports, through the Association for the Advancement of Sustainability in Higher Education (AASHE). The University of Idaho Greenhouse Gas Assessment was submitted to AASHE in September 2008, followed by this report—the University of Idaho Climate Action Plan—in January 2010.

In Spring 2009, the University of Idaho Sustainability Committee set 2030 as University's target date for climate neutrality. To keep the University on pace for this goal, the committee also set the following intermediate targets: 25% reduction in emissions by 2012, 50% reduction in emissions by 2016, and 82% reduction in emissions by 2023.

CHICAGO CLIMATE EXCHANGE COMMITMENT

The University of Idaho also joined the Chicago Climate Exchange (CCX) in March 2007. By joining CCX, the University committed to a 6% reduction in GHG emissions by 2010 from a fiscal year 2001 baseline. To reach this target, cumulative annual reduction goals of 1.5% from the baseline must be met starting in 2007. If the university fails to meet annual targets, it will buy carbon credits to make up the shortfall. If the university exceeds reduction targets, it can sell credits on the carbon market. The University has already exceeded its targets for 2007 and 2008, resulting in the banking of 1,200 tons of carbon credits for each of the two years.

TALLOIRES COMMITMENT

The University of Idaho signed the Talloires Declaration in 2005. The Talloires Declaration begins with a statement of deep concern over the "unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources." It calls for the higher education community to work together through "education, research, policy formation, and information exchange" to provide leadership in solving this global problem. The declaration concludes with a ten point action plan to which signatories commit. These steps incorporate sustainability and environmental literacy into teaching, administration, research, outreach, and all other aspects of university operations. As a signatory of the Talloires declaration, the University has committed to these standards.

UNIVERSITY OF IDAHO GREENHOUSE GAS INVENTORY

In September 2008, the University of Idaho published its first greenhouse gas (GHG) inventory. The assessment includes the Moscow Campus and operations within a 15 mile radius of the Moscow Campus. This includes 264 buildings containing 4,100,000 square feet. The operational baseline identifies emissions sources to be included in the assessment. The inventory follows the World Resource Institute and World Business Council for Sustainable Development *Greenhouse Gas Protocol* (2004) by identifying emission sources by scope. Scope 1 emissions include direct GHG emissions from sources owned or controlled by the University of Idaho. Scope 2 accounts for GHG emissions from the generation of purchased electricity. Scope 3 allows for the treatment of other indirect emissions not included in Scopes 1 and 2. Table 1 summarizes the University's emissions sources included in the inventory.

Scope 1 Emissions	Scope 2 Emissions	Scope 3 Emissions
Natural Gas	Electricity	Waste
Campus Fleet		Commuter Travel
Refrigerants		Air Travel
		Animals

Table 1 Emission sources by scope

Table 2 shows the University's greenhouse gas emissions from 2005 to 2007. In 2005, total emissions were 39,099 metric tons of carbon dioxide equivalent (MT CO_2e). During Fall 2008, a commuter survey was completed that enabled a more accurate estimate of emissions from commuter travel. Data from this survey will improve the quality of future evaluations. The complete inventory will be updated every two years, with the next update scheduled for September 2010.

	2005	2006	2007
Natural Gas	4,370	4,251	5,276
Campus Fleet	2,617	2,475	2,230
Refrigerants	88	88	88
Electricity	26,952	26,740	26,689
Waste	345	345	345
Commuter Travel	2,050	2,037	2,044
Air Travel	1,894	1,911	2,181
Animals	784	829	787
Total MT CO2e	39,099	38,675	39,640

Table 2 GHG emissions by source

Figure 1 shows that in 2007, electricity and natural gas use resulted in 80% of the University of Idaho's greenhouse gas emissions, reflecting a profile dominated by building energy use. Consequently, the University should prioritize building efficiency in future reduction efforts. The complete GHG inventory can be found at www.uidaho.edu/sustainability.

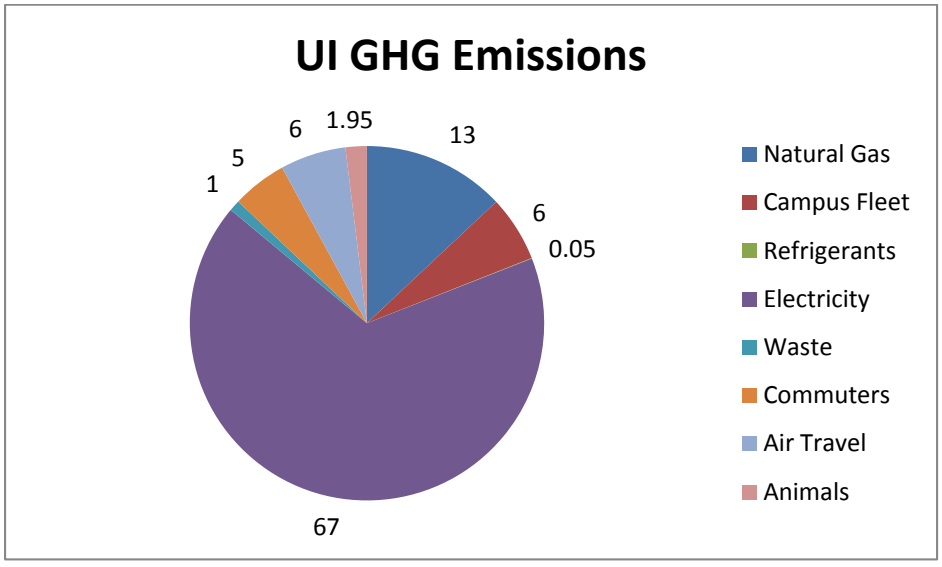


Figure 1 2007 GHG emissions sources in percentages

CLIMATE ACTION PLAN

The first priority of the University of Idaho's Climate Action Plan (CAP) is to reduce GHG emissions. Conservation as a strategy has the highest return on investment, is cost-effective, and reduces vulnerability to future higher energy costs. Many conservation projects involve implementing newer and more efficient technologies. Even though these projects are cost-effective, upfront capitalization is a major obstacle. Other conservation efforts require management changes or broad participation by staff, faculty, and students. These often require little in terms of capitalization cost, but are made difficult by the need for education and participation. It is often easier to change technologies than it is to change attitudes and behaviors.

Because of budget constraints, the University has not built any new buildings on the main campus since 2005. As the university moves forward, new construction needs to treat energy efficiency as a priority. Climate change, peak oil, and increased demand will increase future energy prices. The larger our energy footprint, the more cost and risk we face over the long-term. Eighty percent of the University's GHG emissions result from building energy use. The most important strategy moving forward is to minimize the energy footprint of new buildings while increasing the efficiency of our existing facilities.

Despite its potential, conservation will not be sufficient to achieve carbon neutrality. One option is to generate renewable energy for campus and to offset other energy uses. One proposed renewable energy project is to install a turbine and generator in the steam plant to generate electricity using the biomass that we already burn to heat and cool campus. This project is cost-effective, with a 10 year or less return on investment and a project life of 30 years.

Another strategy is to develop local offsets for several sources of emissions such as commuter and air travel. Small, incremental offset fees over several decades will raise capital for larger, more cost-effective projects that benefit campus and offset emission sources on an ongoing basis. This is preferable to buying certificates or carbon credits on the open market.

PLAN DEVELOPMENT PROCESS

This plan was written by the Sustainability Director and staff in the University of Idaho Sustainability Center with input and feedback from many individuals across campus.

As a first step towards developing a comprehensive plan, a subcommittee of the Sustainability Committee—the Energy and GHG Reduction Subcommittee—was formed to identify emissions reduction activities. Three working groups were formed out of this subcommittee:

a. Energy
b. Transportation
c. Solid Waste, Purchasing, and Food

These groups were charged with identifying projects that would enable the University to reach its carbon reduction targets. The Climate Action Plan was endorsed by the Sustainability Steering Committee and forwarded to the Climate Leadership Committee. This group endorsed the plan and forwarded it to President Duane Nellis. After receiving presidential endorsement, the plan was submitted to AASHE to fulfill our obligation under ACUPCC. The plan was also posted on the University of Idaho Sustainability Center Web site: www.uidaho.edu/sustainability.

CURRENT EMISSIONS REDUCTION PROJECTS

University of Idaho is currently implementing large-scale energy efficiency projects to reduce energy costs. These projects are cost effective and reflect sound fiscal and environmental stewardship. The most important energy conservation effort on campus is the implementation of a Performance Contract that includes $30,000,000 worth of projects. In 2007, McKinstry Essention, Inc., an Energy Service Company (ESCO), performed a technical audit of the University of Idaho, which identified potential energy savings projects with a payback of less than 25 years. Implementations of many of these projects are currently underway and expected to be completed in 2012. These projects are expected to account for significant annual emissions reductions:

- 4,512 $MTCO_2e$ from avoided Electricity Usage
- 1,040 $MTCO_2e$ from avoided Natural Gas Usage

These reductions total approximately 1/8 of the 2005 University carbon footprint. Many other carbon reduction projects are also underway. A more comprehensive list of recent and current projects is included in Appendix A.

ENERGY

In 2007, the University of Idaho emitted 38,981 metric tons of CO_2e greenhouse gases into the atmosphere, 80% of which resulted from electricity and natural gas usage. To reach our emission reduction targets, considerable decreases in electricity and natural gas use will be required. The following is a list of potential projects and policy measures that will help reduce electricity and natural gas use at the University.

CAMPUS-WIDE PROJECTS

The central steam system which supports heating and cooling for 75% of campus buildings is more efficient than individual building-level heating and cooling systems. A number of projects are being evaluated or are underway to expand and improve this system:

1. Connect more buildings to the central steam system to eliminate electricity and natural gas use for heating and cooling isolated buildings. As part of the ESCO process, the Menard Law building will be connected to the steam tunnel system, thereby eliminating the current electrical heat system. The challenge with extending the steam system is cost, which is roughly $5,000 per linear foot.

2. Compare steam pressure supply to actual pressure needed at buildings serviced by steam. If the current delivery pressure is excessive, decrease the pressure to the lowest level required for the delivery of needed downstream pressure. This project is currently underway.

3. Determine if any independent air compressors are still operating in university buildings. If so, remove these compressors and connect the buildings to the central steam system whenever possible. Connecting these air systems to the central air system will allow the one main compressor at the steam plant to handle all air needs more efficiently, using less electricity than small compressors scattered all over campus.

4. Add an additional wood-fired boiler to the steam plant facility. This will eliminate most natural gas use at the steam plant (emergencies or major breakdown backup only).

    a. Estimated cost of $26,000,000.
    b. Yearly Emissions Reduction of 3,412 Metric Tons CO_2e.

BUILDING ENERGY USE REDUCTION PROJECTS

The Performance Contract includes large, capital projects (such as steam plant improvements) and campus-wide projects (such as lighting upgrades) with a payback of 25 years or less. Once completed, other efforts will be needed to add smaller projects and projects with longer payback periods:

1. Increase the resolution of building modeling completed by McKinstry. The initial E-Quest modeling provided enough resolution to look at major HVAC projects. A more detailed model will allow planning for additional projects not identified in the first effort.

2. Change the management of buildings to result in additional reductions. This effort could include the following measures:

    a. Concentrate classes after 5pm into as few buildings as possible, allowing night setback operations to be implemented in all other buildings.

    b. Add a "space czar" staff position and empower that person to allocate space more efficiently. This position would also develop policies to combine and minimize server rooms needing extra cooling (or locate servers on outside walls to utilize outside air instead of chilled water), and to reduce impacts from labs with fume hoods. Buildings with labs use double to triple the heating energy of other buildings.

    c. Optimize the use of automated environmental controls. Inefficiencies currently result from how buildings are being managed.

    d. Firmly enforce State of Idaho standards for managing building temperatures as required by State of Idaho Executive Order 2005-12.

    e. Select a campus building and pilot the LEED Existing Building Operations and Maintenance process (with a focus on Energy and Atmosphere credits) to assess the practicality of the program for campus-wide implementation.

3. Develop, distribute, and follow up on energy reports for specific campus operations. Develop site-specific energy reduction plans for operations with staff.

4. Fund Energy Efficiency/Conservation Specialists through the Utility Budget. Currently, all funding for electrical, HVAC controls, and maintenance and operations personnel comes from the Facilities budget. Employee priorities are thereby focused on general maintenance and avoidance of occupant complaints. With the many maintenance needs on campus, this often results in little time spent managing and optimizing HVAC and electrical systems for energy efficiency. In addition, a conflict can occur between energy conservation efforts and occupant satisfaction; it is common for maintenance personnel to ignore energy conservation in favor of occupant preferences. If dedicated individuals are not appointed, the University loses out on energy savings developed through the Performance Contract, and will have difficulty capitalizing on future energy-savings opportunities.

5. Reduce natural gas usage by the most prevalent users on-campus. The table below shows the top natural gas (NG) users on-campus (excluding the steam plant). Undergo site specific assessments at these facilities to determine ways to significantly reduce natural gas usage.

Building	Yearly NG Usage (Therms)	Yearly Emissions (MT CO2e)
Kibbie Dome	118,851	644
Holm Center	94,210	510
USDA Research Barn (Incinerator)	39,812	216
Martin Lab	28,239	153
Facilities Services Center	27,919	151
Pf--Forestry Greenhouse #1	19,415	105
North Campus Center	14,869	81
Industrial Arts Building	14,088	76
Total	357,403	1,936

Table 3 Largest energy using buildings on campus

NEW BUILDINGS

The vast majority of energy use at the University of Idaho is building-related. The current building policy at University is that all new construction and major remodels must attain at least Silver LEED certification. While this is a major step forward, it is not sufficient to meet the University's future needs for new buildings. Every new building that is not net-zero in terms of energy and carbon emissions is creating a larger footprint that will need to be minimized or offset in the future.

An alternative approach to designing and building new buildings allows for considering the total costs of ownership. The current strategy considers the upfront cost of construction in isolation from the maintenance and operations costs of the building over its life-time. This leads to an emphasis on cheaper upfront costs at the expense of long-term operational costs. For example, Kats (2003) studied 40 LEED buildings in California and found that, on average, they cost 2% more in initial construction costs, but save 20% over the life time of the building. Kats concluded that higher performance buildings saved more over time in operation costs, resulting in a lower cost of ownership over the life of the building than for equivalent conventional buildings. Davis Langdon (2009) found no statistically significant cost differences between LEED buildings and non LEED buildings. In some cases, LEED buildings were cheaper on average. Davis Langdon also found that it is important to seek LEED standards from the very start of project planning. Modifying a building later in the design process inflates cost and leads to perceptions of green buildings being more expensive. In fact, many LEED Silver projects are more expensive than Gold because of the cost of redesign. LEED Silver is a common regulatory requirement, and some buildings designed to meet Silver standards were less cost efficient

because the process was one of adding on features to achieve the standard rather than designing the building from the start to achieve the standard. Davis Langdon also found that traditional building costs have gone up by 10% in the last decade as regulations have become more stringent, further improving cost comparisons between green and traditional buildings.

The University of Idaho's current building policy of LEED Silver needs to be progressively strengthened at the pace of advances in building design and construction. We are already at a point where all three structures currently in design are expected to be LEED Platinum. *The baseline standard for new buildings at the University should be strengthened to Gold in the near-term and to Platinum by 2012.* The goal should be net zero as soon as is practical. Otherwise, every new building will make the task of achieving carbon neutrality more difficult and expensive.

ELECTRICITY PLUG-LOAD REDUCTION

A number of steps can be taken to reduce energy used by plugged-in equipment in buildings. This equipment not only uses electricity, but also generates heat while it operates. Using less electricity as part of plug-load also results in lower cooling demand for campus and building systems, resulting in additional energy savings.

1. Implement an Energy Star™ office equipment purchasing policy to reduce plug loads during and between office equipment operations.

2. Turn off all electronic equipment when not in use, particularly as people exit their offices at the end of the day and week.

3. Change energy settings on computers. Changing power settings to reduce electricity use by computers also reduces HVAC energy use associated with cooling computer labs and servers. The University's Information Technology Department (ITS) is willing to implement a network-wide change in the computer lab computers, but is blocked by software issues. Their current software is unable to wake the machines up for virus protection updates. They hope that the next Windows operating system will enable them to address this problem.

4. Change to laptops for as much of computer use on-campus as possible. Laptops use a fraction of the energy of desktops and require less cooling. Energy savings from using a laptop instead of a desktop are estimated to be between 50% and 80% (http://www.eu-energystar.org/en/en_022p.shtml).

5. Analyze the current and optimum locations of servers in terms of HVAC requirements. The University needs to inventory all servers on-campus, and needs to determine efficiency in terms of electricity use and heating and cooling needs. The goal is to reduce heating and cooling loads caused by computer labs and servers.

6. Determine opportunities to switch to centralized printers and minimize the use of personal printers. This will reduce plug load and background power use, enable the purchase of duplexing machines that save paper, and reduce the overall cost of printing on-campus, which is affected by purchases, electricity use, heating and cooling loads, and recycling.

RENEWABLE ENERGY SOURCES

University of Idaho has a number of options for developing renewable energy sources. Using renewable energy on campus reduces the amount of electricity and natural gas that the University needs to purchase and use, thereby reducing our GHG footprint.

BIOMASS

The most viable option for generating renewable energy beyond a pilot scale is to add a steam turbine and generator to the current University steam plant. The current system would support a 450 KW system generating an estimated 2,571 mWh per year. This would generate electricity from biomass already burned to produce steam for campus. University Facilities has explored the feasibility of the project, but has not located a source of funding to capitalize it. Costs for equipment and installation are estimated at $750,000, with a return on investment of 10 years or less. The project would generate annual emissions reductions of 1,074 MT CO_2e.

WIND

The University of Idaho Moscow campus has limited potential to develop wind as a meaningful source of energy. The technology is important to our region, and pilot and demonstration projects should be developed for education and outreach efforts, but the technology is not currently part of the University's emissions reduction strategy for the Moscow campus. However, there has been no feasibility assessment of wind projects on other University properties around the state. As a first step, a GIS layer needs to be developed that includes all University properties in the state. The properties need to be assessed for their potential for renewable energy production, including wind and geothermal.

In addition to building its own wind projects, another option is to buy equity in a wind project and sell the electricity. The generated electricity would offset the University emissions profile while paying back the initial investment. This option needs to be further explored as an investment and offsetting strategy.

SOLAR

Large-scale solar projects are still not cost effective when compared to other renewable energy options for the university. Initial calculations put solar electric generation systems in the 32-50 year payback range, depending on future electricity prices. Small pilot projects that meet educational and outreach

objectives have value, but the technology needs to become more cost-effective before widespread adoption.

University Facilities is currently piloting solar powered outdoor lights near the Student Recreation Center. The lights are performing well, although they have only been installed for one year. Questions concerning battery life and durability of other components of the lighting systems cannot be answered yet. The installation of additional solar outdoor lights will be considered in locations on the edges of campus not readily served by a power source, or in places where the installations will be temporary. Regardless of the outcome of the pilot, the technology still has problems that limit wide-scale deployment, such as batteries that must be periodically replaced.

University Facilities is also currently investigating light emitting diode (LED) lamp arrays that can be retrofitted for existing exterior lighting fixtures, replacing the existing lamps and ballasts with a screw-in LED array. If Facilities determines that this is a reasonable course of action, it will be a cost-effective way to significantly reduce electricity use on campus with a minimal capital investment.

SOLID WASTE

The University of Idaho produces approximately 1,500 tons of waste per year, resulting in the release of 242 metric tons of CO_2e into the atmosphere from the decomposition and transportation of waste. To reduce waste-related emissions, UI must minimize the amount of overall waste produced and recycled. UI has set a goal of reducing waste by 20% and increasing recycling by 60% by 2013. In Spring 2009, the University's Sustainability Center presented a Request for Innovation (RFI) proposal to meet its 2013 goal. The proposal addresses waste management issues including purchasing, handling, and disposal. This project was accepted as part of the President's Strategic Innovation Initiative in the fall of 2009.

Projects include the following:

- Paper reduction – Increase duplex copying on campus. ITS will start a pilot program using duplex mode as the default printing option for several University computer labs this spring. Many departments are already shifting to an electronic-only format for documents. This practice needs to be encouraged and accelerated.
- Office furnishings – Move to standardized office furnishings made of durable wood or metal that will be kept or re-sold back to campus users at a reduced price. Eliminate the use of inexpensive particle board furniture that breaks apart and cannot be reused.
- Education and Outreach – Expand educational and service-learning projects concerning recycling. This includes offering a free waste audit and consulting program to help offices and departments reduce waste, implementing and advertising a recycling program at sporting events, and other measures. Tailgate recycling at football games was launched this year, and recycling inside Kibbie Dome was piloted during the last game of the 2009 football season.
- Food Waste – Compost all food waste from campus. The University began composting food waste from campus dining operations and from the Commons in January 2010. Several other coffee shops and food vendor locations generate small amounts of food waste. Composting services will be extended to these smaller locations once the two larger food waste stream operations are well established.
- Minimum Waste Catering – Starting in Fall 2009, University Catering moved to a minimum waste catering system using reusable or compostable plates, flatware, and other serving utensils.
- Recycled Paper – The University of Idaho is in the process of developing a policy requiring the use of a minimum 30% recycled-content paper for on-campus multipurpose paper purchases, and the policy will also encourage the purchase and use of 100% post-consumer, recycled-content paper.

- Bottled Water – Reduce the use of disposable water bottles. A reusable water bottle campaign was launched in Fall 2009. UISC and the Office of the Dean of Students gave stainless steel water bottles to every incoming freshman and graduate student.
- Electronics and E-waste – Starting in 2010, E-waste will be banned from the landfill in Oregon where we ship our waste. E-waste is now recycled through University Surplus. E-waste is defined as anything with a plug, battery, or microchip. Containers for small electronics have already been distributed by the University's Sustainability Center, and Surplus already processes approximately 25 tons of computers and monitors per year. These efforts will be expanded in 2010. The leasing of electronic equipment should be evaluated in terms of the total cost of ownership of equipment in comparison to our current purchase and recycle practice.

ANIMALS AND FARM OPERATIONS

The University of Idaho has a small, local population of livestock used for research and educational purposes through the Palouse Research, Extension, and Education Center (PREEC). PREEC includes the dairy center, beef cattle center, and sheep center, with a total herd of 400-500 animals. This number is expected to remain constant for at least the next five years. With the creation of the Environmental Livestock Center in southern Idaho, some research currently conducted at the Moscow campus may shift south in the next 10-15 years, reducing local herd size by 20-25%. As these animals digest food and excrete waste they release methane (CH_4), so a reduced herd size will result in lower emissions in Moscow while increasing cattle-associated emissions in southern Idaho. Another potent greenhouse gas, nitrous oxide (N_2O), is released through the management of animal waste.

In 2005, emissions from livestock at the University amounted to 784 MT CO_2e. To reduce these emissions, animal waste should be composted before being distributed. Composting stabilizes carbon so that less is released into the atmosphere. The composted material will be used as animal bedding or applied to rangelands. Composting has the potential to reduce manure-related emissions by 30-40%.

The University is also studying carbon sequestration through land management techniques such as no-till farming and re-vegetation of non-seeded areas. PREEC has already converted one-third of its crop land to a direct seed (no till) system, and plans to convert half to no-till by 2012-2013. No-till farming increases carbon sequestered in the soil rather than allowing it to escape into the atmosphere as carbon dioxide. The University will continue to use multiple tillage systems on the remaining lands to meet faculty research needs.

TRANSPORTATION

Transportation is the fastest growing energy use in the world. It is also a major source of greenhouse gas emissions, accounting for more than half of the world's oil use. In the United States, transportation patterns are dominated by the personal automobile, accounting for 81% of our transportation energy use, 96% of which comes from oil. Furthermore, transportation produces one-third of US carbon emissions.

In 2007, the University of Idaho released 6,455 metric tons of CO_2e emissions related to transportation: 2,044 metric tons from commuting, 2,230 metric tons from the campus fleet, and 2,181 from air travel. These three sources constituted 16% of total emissions at the University in 2007.

COMMUTING

Moscow is a relatively small community in size and population. Ninety-three percent of off-campus students live within the Moscow city limits with a median commute of 1 mile. For faculty and staff, 75% live in Moscow, with a median commute of 1.6 miles. Despite this, motor vehicle commuting is popular, including 32% of off-campus students and 75% of faculty and staff.

Strategies for reducing commuter emissions include encouraging alternative modes of transportation, encouraging carpooling and ride sharing, and adding a small fee to the parking pass to build a fund for projects that mitigate and offset commuter impacts.

PROMOTE ALTERNATIVE MODES OF TRANSPORTATION

- Create a University of Idaho Commuter Club (CC), offering special parking passes for students and faculty who agree to carpool to campus. Joining the UICC would allow commuters better parking opportunities. For example, a single carpool pass could allow access to a blue lot. A two person carpool, with two passes in the car, would allow access to a red lot, while three passes or more would allow access to a gold lot, and so on. More people in the carpool results in better access to parking. Blue passes should be priced with this club in mind. Cost studies could determine what is feasible and effective. The result is a reduction in vehicles traveling to campus, and a reduction in GHG emissions. Meanwhile, benefits are incentivized for the consumer by saving them time and money (compared to cost of a gold permit or inconvenience of remote parking).

- Include a “Carpool Finder” on the University of Idaho Transportation Web site to assist individuals who are looking for a carpool.

- Launch “Leave Your Car at Home Day” once a year, once a semester, once a month, or once a week. Launching a work from home day to avoid the commute entirely for those who do not need to work from campus is an even better option.

- Install traffic control devices such as speed tables to slow traffic in and around campus. Bike lanes and well-labeled driving lanes are also a deterrent to speeding and reckless driving.

- Encourage the use of public transit by working with transit officials to reduce student, faculty, and staff ridership cost.

- Start a Staff Car Loaner program—a stumbling block for many staff and faculty wanting to use alternative transportation is being unable to respond to an emergency involving their children due to the lack of a car. A loaner program for emergencies takes care of this problem. This could be modeled after Portland, Oregon’s ZipCar™ program.

- Facilitate safe bicycle commuting by creating bike lanes on campus. Prohibiting parking along some streets on campus would promote a more friendly and healthy environment for pedestrians and bicyclists. It would also make space for much needed bike lanes, reducing dangerous bike/vehicle interactions without needing to rebuild roads on campus.

- Develop the bike lanes along 6th Street that run directly from campus to downtown Moscow. Currently, these routes are incomplete and segmented. Routes should also extend along the eastern edge of campus and have a more visible and direct connection with the Latah County trail system.

- Add more bike parking, including covered spaces, to increase convenience. Make lockers available to bike commuters.

- Promote bicycling by including information on local bike shops and a “Best Bike Routes” map on University's Transportation Web site. Additionally, bike maintenance classes should continue to be hosted on campus in conjunction with local bike shops.

- Expand the Parking and Transit website to include information on transit alternatives on campus and within Moscow. Use it to support and educate the campus community on public transit options, bike clinics, and pedestrian improvements.

- Develop an orientation packet to inform new students, faculty, and staff of transportation information and alternatives. Include Best Routes and other information from the Parking & Transportation Web site.

- Work with local groups to set up quarterly bike repair discounts and consultations.

INCREASE MANAGEMENT EMPHASIS ON A PEDESTRIAN-ORIENTED CAMPUS

- Potential traffic control projects that would benefit alternative transportation and increase the pedestrian-oriented management of campus include the following:
    - Close 6th Street from Rayburn to Line Street.
    - Make 6th Street one-way West from Rayburn to Stadium.
    - Make Idaho Ave Ext. one-way going west (already planned).
    - Make Rayburn and Stadium one-way going north.
- Collect traffic count data for pedestrians, bikes, and cars on campus streets.
- Increase visibility of major pedestrian crosswalks. Eliminate confusion and conflict with proper lighting and signage or traffic flow control.

DEVELOP OFFSETS THAT BENEFIT CAMPUS AND REDUCE EMISSIONS-RELATED IMPACTS

1. Add a "carbon fee" to parking passes sold. The fee should be sufficient to fund on-campus offset projects to reduce commuter emissions. The goal is carbon neutrality by 2030. This means that the fee can be structured to develop conservation or renewable energy infrastructure over a 20 year period capable of offsetting annual emissions from commuter travel.

2. Do not allow (or charge a premium for) freshman parking passes. Access to Grey and Purple lots could be further limited with these rules, creating space for carpool lots and alternative transit infrastructure. If deemed necessary, there could be a policy that only allows freshman to buy Blue Parking passes. This policy would allow a car for trips home, while still relieving parking congestion and discouraging driving. This measure would be further aided by a comprehensive ride-share program.

CAMPUS FLEET

The University of Idaho maintains a variety of vehicles to ensure the safety and viability of our campus community, and for faculty and staff travel throughout the state. The current Moscow campus vehicle fleet is shown in Table 4.

Passenger car, excluding police car	31
Passenger Van, up to 15 passengers	44
Pickup / Van, Cargo or Delivery (1 ton & under)	201
Trailer: small utility, etc. (1 ton & under)	26
Bus / Van, over 15 passenger	2
Motor Home	1
Trailer: large flat bed, enclosed, etc. (over 1 ton)	2
Truck (over 1 ton) excluding 5 above	14
Semi Tractor	2
ATV, Cushman, or off-road Motorcycle	1
Other	4

Table 4 University-owned vehicles on Moscow Campus

While many of these vehicles are a necessary part of the campus community, opportunities exist to reduce GHG emissions from use and maintenance of the University fleet:

- Purchase new vehicles with highest possible mileage per gallon for the intended use.
- Continue the pilot program using electric vehicles for on-campus use.
- Analyze the feasibility of a biodiesel program to produce fuel for the campus fleet. Although there are problems with biodiesel feasibility, including the food-versus-fuel conflict, net-energy gain, and cost-effectiveness, University faculty have considerable expertise in the field. Drawing on this expertise could stimulate new investment and research opportunities at the university while also reducing emissions.
- Explore federal, state, and local incentives for purchasing low- or zero-emission vehicles.
- Explore federal, state, and local incentives for the installation of Electric Vehicle (EV) Charging Stations both on-campus and in the community.

FACULTY AND STAFF AIR TRAVEL

Air travel is a necessary part of university operations. Other than encouraging more video conferencing, few alternatives exist to air travel. Offsetting emissions with meaningful investment in other GHG reduction or renewable energy projects is another option.

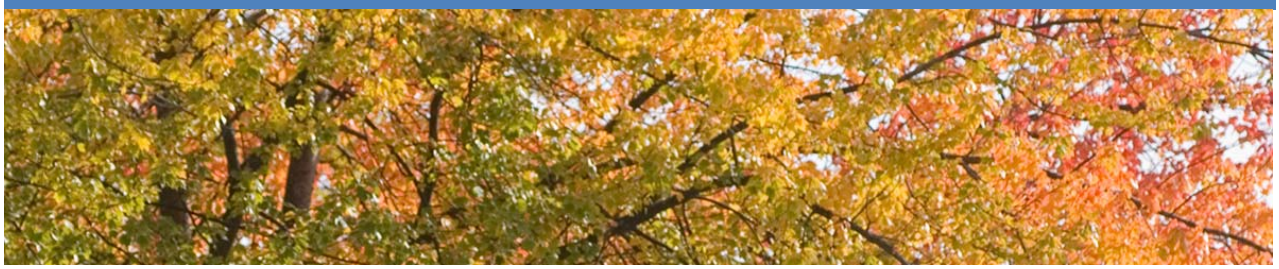
- Develop an air travel offset fund for on-campus emissions reductions projects or renewable energy projects.
- When University faculty travel for guest lectures, strongly encourage a carbon offset to be purchased as part of visiting expenses.
- Encourage the use of carpooling to and from airports by faculty and staff. The carpool finder services outlined in the commuter section could serve faculty and staff travel as well.

NEXT STEPS

This report is a first attempt to assemble strategies and projects to reduce the University of Idaho's GHG footprint. It falls short of developing an overall strategy for reaching carbon neutrality. Many more strategies and projects will have to be identified and implemented to reach that goal over the next couple decades.

After the formal submission of the University's Climate Action Plan (CAP) to AASHE in January of 2010 we will continue these efforts. The UI GHG inventory will be updated in September 2010. The University's Climate Action Plan needs to be updated every two years.

BIBLIOGRAPHY



Davis Langdon. (2007). The Cost of green revisited: Reexamining the feasibility and cost impact of sustainable design in the light of increased market adoption. Available online at http://www.davislangdon.com/upload/images/publications/USA/The%20Cost%20of%20Green%20Revisited.pdf .

Kats, G. (2003). The Costs and financial benefits of green buildings: A report to California's Sustainable Building Task Force. Available online at http://www.ciwmb.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf .

Randolph, J. & Masters, G. M. (2008). *Energy for Sustainability: Technology, Planning, Policy.* Washington, DC: Island Press.

World Resources Institute (WRI) and World Business Council for Sustainable Development. (2004). The Greenhouse gas protocol: A corporate accounting and reporting standard (Revised Edition). Available online at http://www.ghgprotocol.org/ .

APPENDIX A – RECENT AND CURRENT CLIMATE CHANGE EFFORTS

This section inventories recently completed projects or those that are currently being implemented at the University of Idaho to support reductions in GHG emissions.

1. **2007 ESCO Technical Audit Projects**:

    a. **Conversion of HVAC Control Systems** – Convert systems in many buildings from the old, inefficient pneumatic control systems to the centrally-controlled Siemens Direct Digital Control (DDC) system. These upgrades improve the operational efficiency of the HVAC systems by reducing energy waste from out-of-adjustment/calibration issues, and they allow temperatures to be reduced during non-operational hours.

    b. **Lighting Retrofits** – Nearly all incandescent lights on campus were replaced with efficient fluorescent lamps, and many older fluorescent lighting fixtures were retrofitted with more efficient lamps and ballasts. In addition, photocell, occupancy sensors, and timed switches were installed at various locations to reduce unnecessary hours of operation of existing lighting. The lighting initiatives provide an annual savings of over 5 million kWh of electricity, which translates to over $200,000 per year in cost savings.

    c. **Variable Frequency Drives (VFD)** – VFDs were installed to control the speed of many pumps and fan motors for various Heating, Ventilation, and Air Conditioning (HVAC) systems. Typically, these motors run at a constant speed needed to provide the maximum flow and therefore waste energy during partial load operation. Significant energy savings result from controlling speed to provide only the flow needed. The VFD initiatives provide an annual savings of over 1.6 million kWh of electricity, which translates to over $63,000 per year in cost savings. Variable Frequency Drives are an element of the University of Idaho Design and Construction Standards and are included where appropriate in all new construction and renovation efforts.

    d. **Unoccupied Building HVAC Control** – For a variety of reasons, many University buildings are unnecessarily heated, cooled, and ventilated as if they were occupied 24 hours-per-day. In order to implement an unoccupied setback sequence, it is typically necessary to upgrade the existing HVAC controls, and it is often necessary to provide a supplementary cooling system for specific areas that require constant cooling (such as computer server rooms). The Unoccupied Mode initiatives provide annual savings of over 1.6 million kWh of electricity, 11,900 million Btu of heating energy, and 500 million Btu of cooling energy, which translates to over $150,000 per year in utility cost savings.

e. **Steam Plant Woodchip Storage and Drying Facility** – Completed during Summer 2009. A storage facility to keep the supply of wood chips out of the weather was built, and an on-going research/pilot program was established to study the drying out of wet or moist wood chips using heat or by using low humidity ambient outside air.

f. **Adoption of the Governor of Idaho's Executive Order 2005-12** – "Energy Conservation Considerations in State Buildings." More information available at http://adm.idaho.gov/adminrules/bulletin/bul/nov00.pdf .

g. **Implementation of the University Administrative Procedures Manual 40.04 New and Major Renovation Building Policy** – This policy requires that all new construction and major renovation projects on the University of Idaho campus adhere to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) for New Construction certification standards at least at the Silver level. Attainment of the higher levels of Gold or Platinum certification is highly encouraged. More information is available at http://www.uihome.uidaho.edu/default.aspx?pid=105677 .

h. **Using Wood Rather than Natural Gas** – This practice has saved more than $600,000 in energy costs per year, even though steam production has increased to meet University's needs. Natural gas use has decreased, significant costs have been avoided, and efficient operation of the steam boilers has resulted from wood-fuel use.

i. **Development of a Central Campus Chilled-water Production and Distribution System** – This initiative has reduced the duplication of efforts around campus and improved energy efficiency. An efficient, double-effect steam absorption chiller and a new large, efficient electric chiller were recently installed at the North Campus Chilled Water Plant. The new electric chiller will become operational in the summer of 2010. The absorption chiller uses steam produced primarily from less-expensive wood fuel instead of electricity, and helps defer the need for additional electrical system infrastructure (specifically a third substation). These units increase the central chilled water system capacity, allowing the decommissioning of old and inefficient chillers and smaller, multiple air conditioning units in individual buildings.

j. **Building HVAC Systems Commissioning –** An on-going program which analyzes, tests, and makes improvements to control sequences in building HVAC systems. The University has completed 6 buildings to date, with 9 more currently in-process.

2. **Metering of Building Energy Use** – Since energy usage cannot be managed unless it is measured, the University of Idaho has initiated a building utility sub-metering program with the goal of metering and recording all utility usage for every building on the University campus. Well over 100 meters have been added or replaced in the last several years, which completes Phase 1 and nearly completes Phase 2 of our Building Sub-metering program. When Phase 2 is complete, all major University campus buildings will be fully sub-metered for energy usage. University has partnered with Avista, the local power utility, who is providing over $75,000 in equipment, software, and installation reimbursement, to enable the university to electronically read the sub-meters at all University buildings. The major advantage of electronic over manual reading is that the meters are read much more frequently (for University's system,

on a 5 minute interval). This detailed data is available for savings analysis and building system troubleshooting. Phase 3 involves metering energy for minor buildings such as farm facilities and temporary buildings, and metering water usage for all major buildings. Phase 3 will add the capability for electronic meter reading of University steam condensate and water sub-meters in all major buildings.

3. **Installation of Occupancy Sensor Lights** – These were installed in three large classrooms of the Menard Law Building. The project will reduce energy consumption and costs by keeping lights off when the classrooms are not occupied – this initiative is funded by the UISC and will be completed by June 2010.

4. **Installation of Solar-powered LED Path Lighting** – This installation along Paradise Creek bicycle path will be completed in 2009. Eleven luminaires (light fixtures) were installed; each uses two 600 lumen LED lamps for a total of 17 watts per luminaire. This installation saves 1,021 kWh per year. In addition to saving energy, the lamp life is also greatly increased by using LED lamps (50,000 hour lamp life) instead of standard metal halide lamps (10,000 hour lamp life); LED lamps also have a higher color rendering index (CRI) than metal halide lamps, which is an added bonus for exterior walkway lighting.

5. **Installation of Solar-powered Ventilation Fans at Hoop House** – This mini-grant should be completed by June 2009.

6. **Energy Efficiency Installations for University Housing and Greek Sororities and Fraternities** – UISC facilitated the entry of 17 Greek houses, Wallace, Towers, and Family Housing into an Avista program for energy upgrades in multi-family housing. Avista paid to install lighting retrofits, insulation upgrades, and water conservation measures for these residences. This program was completed in 2009.

7. **Sustainability Revolving Loan Fund** – This fund was mandated in Spring 2009 for various sustainability projects. Although the policy was established, no funding has been identified to start the fund.

APPENDIX B – CURRICULUM RELEVANT TO CLIMATE CHANGE

The University of Idaho is committed to teaching climate change science across many disciplines. The following tables identify efforts in both curriculum and research.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
Frank Jacobus	ARCH 151 Intro to Built Environment	Introduces concern for climate change across the design disciplines.
Diane Armpriest	ARCH 266 Materials and Methods of Construction	Introduces sustainability issues in material selection and construction technique.
Phil Mead	ARCH 463 ECS I	Thermal principles in the built environment. Teaches passive methods for heating and cooling.
Bruce Haglund	ARCH 464 ECS II	Topics include day lighting and electric lighting design, sustainability, rating systems, site energy generation, and economics of green architecture.
Wendy McClure	ARCH 483 Urban Issues	Urban planning effects on energy use and sustainability are presented.
Wendy McClure	ARCH 504 Sustainable Development Seminar	Students explore the issue of sustainable development.
Sherry McKibben	ARCH 504 Eco Urban Design	Land Use, Transportation, and Environmental connection to CO2 emissions reduction.
Sherry McKibben	ARCH 504 Housing Typologies and Issues	Building design and configuration related to climate change and CO2 reduction.
Bruce Haglund	ARCH 510 Graduate Seminar	Prepares students to design a sustainable building or site.
Bruce Haglund	ARCH 553 Comprehensive Design	Use of interdisciplinary integrated design as a tool toward attaining sustainable design.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
Bruce Haglund	ARCH 554 Research Studio: London & UK	Student research and design of green architecture in London and the UK. Studies abroad offering.
Sherry McKibben	ARCH 554 Arch Studio (Urban Design)	Land Use, Transportation, and Environmental connection to CO2 emissions reduction.
Bruce Haglund	ARCH 556 Graduate Project Studio	Students design a self-articulated sustainable design project.
Bruce Haglund	ARCH 570 Natural Lighting	Hands-on analysis and design of day lit spaces.
Bruce Haglund	ARCH 571 Building Performance	Hands-on analysis of building performance - focused on energy efficiency and user satisfaction.
Bruce Haglund	ARCH 581 English Green Architecture	Preparatory seminar for studies abroad in England focused on green architecture.
Tracie Lee	BUS341 Business Systems	This module has 2 hours of class (in a 4 credit module) focused on ethics and sustainability. Students are given an exam question covering one or the other. They are also asked to discuss macro-environmental factors such as weather and natural resources in a presentation.
Tracie Lee	BUS378 Project Management	Student teams work on real-world projects (often provided by University departments, including the Sustainability Center). We have had at least 2 projects each semester focused on sustainability-related issues.
Eric Stuen	ECON 201 Principles of Economics	This course introduces topics in macroeconomics, a central issue of which is economic growth. Economic growth is relevant to climate change - I discuss how economic growth can, but doesn't necessarily, exacerbate climate change by increasing carbon dioxide emissions.
Eric Stuen	ECON 447 International Development Economics	This course involves theory and evidence for how and why economies develop. Climate change is an important topic in development as measures taken to reduce carbon dioxide emissions can impose costs on economies that may inhibit their development.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
Grindley, Brown, Burton, & Browder	HPRD 201 Physical Activity, Wellness, & Behavior Change	One week in the course discusses Environmental Health (e.g., basics of climate change, water supply, population, and recycling). We went out and planted trees this year too for our lab with the sustainability center.
Grindley	HPRD 351 Social & Environmental Aspects of PA and Wellness	Several classes look at sustainability - how to get people into healthy active lifestyles for the sake of sustaining health and reducing waste and reducing our footprint (e.g., less medicine = less medicine bottles= less waste= less production= less pollution, and walking instead of driving).
Goc Karp, Brown, & Goetz	HPRD 429 Leadership, Pedagogy and Programming in Physical Activity	Students develop healthy active lifestyle programs- these tie into sustaining healthy living. For example, one group looked at bike safety and bike parking. Darin Saul did a guest lecture also.
L. Vierling, Walden, & Hicke	REM/GEOG 450 Global Environmental Change	Major global environmental changes addressed using an interdisciplinary approach. Topics may include processes and principles of ecosystems, biogeochemical cycles, impacts and mitigation of climatic change, atmospheric chemistry, feedbacks between climate and various earth system processes, and trends in global biodiversity.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
L. Vierling	CORE 125 The Earth and Our Place On It	Through class discussion, writing, field trips, community service-learning opportunities, music, art, readings, and film, students in this course explore how residents of the planet are connected to each other and the environment. For this course, the earth is viewed as a system impacted by human and natural forces and shaped by public policies and the acts of ordinary citizens. Central questions of the course concern the sustainability of the earth system, major threats to the system, and each individual's role in maintaining its health.
Bruce Mobarry	BIOL 116 Organisms and Environments	This course teaches the evolutionary history, distribution, and ecology of organisms on Earth, including the effects of humans (e.g. climate change).

Eva Top	BIOL 411 Senior Capstone	The primary objective of the course is to provide the students with an opportunity to apply their scientific knowledge to the "real world" that they will enter upon graduation. They critically read, consider, discuss, and write about specific critical issues that society is facing today. One of the regular topics is climate change.
Armando McDonald	FORP 436/536 Wood Composites	Raw material, processes, properties, and their applications for a number of natural fiber and wood composites made of veneers, particles, and fibers. Additional project assignments required for graduate course. Two half day field trips. Two lectures and one 3-hr lab a week.
Armando McDonald	FORP 438/538 Wood Chemistry	The chemistry of lignocellulosic fiber (natural fiber and wood) formation, agricultural/natural fiber and wood structure and reactions of lignocellulosic compounds. Additional projects and assignments required for graduate course. Two lectures and one 3 hour lab per week.
Armando McDonald	FORP 491 Biomaterial Product and Process Development Lab	Lab to accompany FORP 495 Product and Process Development and Commercialization.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
Coleman & O'Laughlin	FOR501 Grad student seminar on Forest Bio-Energy	Sustainable Forest Biomass Production for Renewable Energy and Climate Change Mitigation Invited speakers will cover technology, policy, biomass feedstock availability, and related issues regarding forest management and woody cropping systems.
Judy Parrish	GEOL 417/517 Paleoclimatology	Examination of how climate in the past 600 million years is studied.
Judy Parrish	GEOL 407/507 Basin analysis	The study of how sedimentary basins are formed and what controls the fill. One of the largest influences on basin fill is climate, so this is a critical part of the course.
Judy Parrish	GEOL 102 Historical Geology	The history of the Earth, including climate change.
Brooke Roberts	PHIL 452/552/ENVS 552 Environmental Philosophy	Environmental responsibility.
Jodi Johnson-Maynard	SOIL 205 The Soil Ecosystem	Lectures on soil organic matter and carbon sequestration; touched on in soil and hydrologic cycle lecture.
Craig	PSY 317 Environmental Psychology	Discussing psychological responses to natural disasters and conservation efforts. In addition, the course discusses at some length the ways in which world views (and gender) impact the use of the environment.
Craig	PSY 320 Social Psychology	Includes a chapter on Environmental Psychology and in particular research on effective and ineffective strategies to promote pro-environment behaviors. Includes a chapter on Consumer Behavior in which "green consumers" are addressed in some depth.
Adam Sowards	HIST 424/524 American Environmental History	Examines the history of human-environment mutual influences over the past few centuries, including political and social movements related to nature.
Jeff Hicke	GEOG 100	Physical Geography, covers introduction to climate change
Jeff Hicke	GEOG 310	Biogeography covers climate change impacts to plant and animal species and their ranges.

FACULTY MEMBER/ INSTRUCTOR	COURSE ID/ TITLE	COURSE DESCRIPTION/ RELEVANCE TO CLIMATE CHANGE
Jeff Hicke	GEOG/RNGE 450	Global environmental change; a large portion of the class is devoted to climate change.
Jeff Hicke	GEOG/ENVS 501	Grand Challenges of Environmental Sciences; a portion of the class is devoted to climate change.
Joseph Kuhl	PlSc 401 Plant Growth and Development	Application of physiological principles to the management of plants in agronomic, horticultural, and forest systems. The same physiological principles are applicable to the changing environment related to climate change.

APPENDIX C – RESEARCH RELEVANT TO CLIMATE CHANGE

DEPARTMENT	FACULTY MEMBER/ INSTRUCTOR	RESEARCH ACTIVITIES RELEVANT TO CLIMATE CHANGE
ARCHITECTURE	Phillip Mead	Health and Design Issues.
HEALTH, PHYSICAL EDUCATION, RECREATION AND DANCE (HPERD)	Goc Karp & Helen Brown	A number of research projects look at physical activity. For example, Karp and Brown are involved with Safe Routes to Schools. It encourages walking and biking to schools. Not only can it help with physical and mental health but it also would cut down on driving and reduce environmental impact.
RANGELAND ECOLOGY AND MANAGEMENT	Lee Vierling	Carbon sequestration assessment of Moscow Mountain forests (DOE funded); Forest photosynthesis rate estimation from satellite data (NSF and ARS funded); Carbon and erosion estimates of soils (BLM funded); various other past projects involving climate and carbon sequestration
DEPT. OF FORESTRY PRODUCTS	Armando McDonald	Development of bio-based products from sustainable natural resources and waste streams. These include: bio-energy, liquid bio-fuels, bio-plastics, natural fiber composites, bio-derived chemicals, value added waste management. These research activities help displace fossil fuel derived fuels and materials by substituting with a bio-derived products that helps sequester carbon and reduce the carbon footprint.

DEPARTMENT	FACULTY MEMBER/ INSTRUCTOR	RESEARCH ACTIVITIES RELEVANT TO CLIMATE CHANGE
DEPT. OF FORESTRY RESOURCES	Coleman & Page-Dumroese	Two MS students research projects on Carbon Negative bio-energy systems where the char byproduct is amended to soil as a natural energy extraction that includes carbon capture and storage. This research is focused on climate change mitigation.
DEPT. OF FORESTRY RESOURCES	Coleman & Gessler	One MS student and staff scientists are working to define static and dynamic factors that define forest site quality. Dynamic factors can then be used to predict changes in potential forest type and growth potential. This research can be used to predict forest responses to climate change.
DEPT. OF GEOLOGICAL SCIENCES	Judy Parrish	Current projects: Stratigraphy, sedimentation, climate, and paleobotany of the Eocene Chuckanut Basin, western Washington (climate in W WA around 40 million years ago); carbonate spring mounds of the Navajo Sandstone (climate and hydrology about 155 million years ago); lateritic paleosols (ancient soils) in the Columbia River Basalts, Idaho, Oregon, and Washington, and their relationship to climate (climate about 15 million years ago).
DEPT. OF PLANT, SOIL AND ENTOMOLOGICAL SCIENCES	Glenn Shewmaker	Switchgrass variety trial at Kimberly, multi-state with Ceres and Noble Foundation.
DEPT. OF PSYCHOLOGY	Craig	The use of nuclear energy and the ways in which persuasive techniques are used effectively to change attitudes.
DEPT. OF PSYCHOLOGY	Craig	In addition, I have a pre-post survey design to determine the effectiveness of the PSY 317 Environmental course on changing attitudes on a variety of Environmental Attitude measures. The control group is students who are not in the course over the same time period.
DEPT. OF RANGELAND ECOLOGY AND MANAGEMENT	Eva Strand	I am serving on a committee in the North American Carbon program. This particular committee is synthesizing current knowledge and proposing new research to quantify the impact of woody encroachment in western semiarid rangelands on the global carbon budget.

DEPARTMENT	FACULTY MEMBER/ INSTRUCTOR	RESEARCH ACTIVITIES RELEVANT TO CLIMATE CHANGE
INSTITUTE FOR PACIFIC NORTHWEST STUDIES	Adam Sowards	Research of Arctic scientific exploration from a century ago, which includes observations of climate and its relationship to other scientific factors. Also, co-authoring a textbook on North American Environmental History that will incorporate climate influences on human-nature interactions and include recent debates over climate change.
DEPT. OF GEOGRAPHY	Jeff Hicke	Changes in insect outbreaks in response to climate change.
DEPT. OF GEOGRAPHY	Jeff Hicke	Carbon exchanges between atmosphere and ecosystems.
DEPT. OF GEOGRAPHY	Jeff Hicke	Changes in Pacific Northwest animal species in response to climate change.
DEPT. OF GEOGRAPHY	Jeff Hicke	Climate change impacts to mountain ecosystems.

APPENDIX D – OUTREACH RELEVANT TO CLIMATE CHANGE

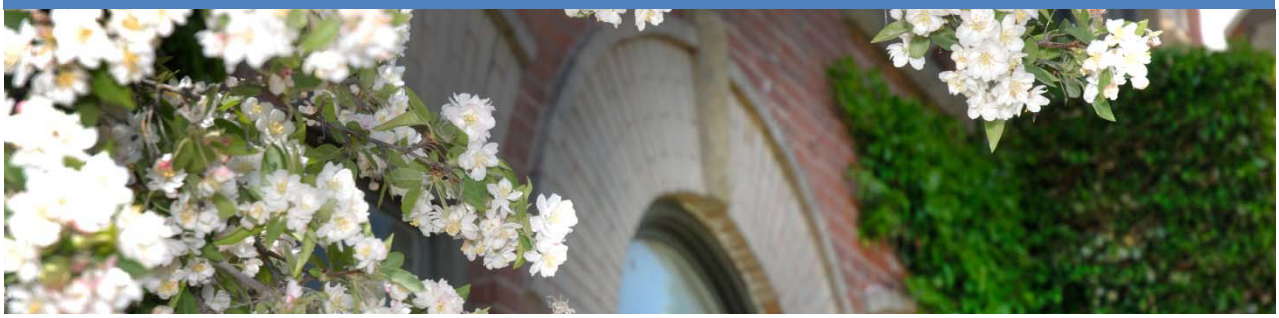
The University of Idaho is highly involved in teaching about methods to reduce carbon emissions and curb climate change to the local, state and regional communities through many efforts. The table below reflects both recent and current efforts by department.

FACULTY MEMBER/ INSTRUCTOR	DEPARTMENT	OUTREACH PROGRAM/ PROJECT NAME	RELEVANCE TO CLIMATE CHANGE
Thomas F. Hess	Dept. of Agriculture	Engineering Capstone Design: Composting project for UI food wastes, dairy wastes, animal mortalities.	Mitigation of food waste to landfill disposal; results in substantial lessening of greenhouse gas emissions (CH4) from anaerobic breakdown in landfill.
Frank Jacobus & Bruce Haglund	Dept. of Architecture	McCall Field Campus Project	A series of design studios and design build studios aimed at building a carbon-neutral campus one building at a time. We began in 2006 and still have a decade of work ahead.
Bruce Haglund & Jay McCormick	Dept. of Architecture	Engineering Innovation Lab Project	An integrated architecture/engineering design studio aimed at developing a net zero energy building for campus. Students worked with the project architect throughout the semester. Funding is being sought for the building.
Coleman	Dept. of Forest Products	Mobile pyrolysis demonstrations.	Forest slash is currently flared as a nuisance. The portable pyrolyzer takes conversion technology to the slash pile and converts biomass into a liquid crude oil and biochar. Biochar is charcoal (80% carbon), which has thousand-year residence times when applied back to the managed forest site. So this is a "carbon-negative" energy production system that solves forest management problems. Web site is: http://www.fs.fed.us/r6/umpqua/projects/fast-pyrolysis/index.shtml

FACULTY MEMBER/ INSTRUCTOR	DEPARTMENT	OUTREACH PROGRAM/ PROJECT NAME	RELEVANCE TO CLIMATE CHANGE
Helen Brown	Dept. of Health, Physical Ed., Recreation and Dance	Safe Routes to School	Support walking and biking to school and work with 7 local schools to decrease auto use.
Helen Brown	Dept. of Health, Physical Ed., Recreation and Dance	Sustainability Food Committee	Support local, organic food in University food system-outcome, lower carbon footprint from food.
Helen Brown	Dept. of Health, Physical Ed., Recreation and Dance (HPERD)	Greening the Curriculum	Working with HPERD faculty to integrate issues of sustainability into CORE HPERD courses.
Jean McIntire and Bob Kesler	Dept. of Sociology and Anthropology and UI Student Financial Aid Services	PCEI Van Pool - Lewiston/Moscow	The Van Pool reduces commuter traffic between Moscow and Lewiston. In one year, this volunteer-driven van saved 4,000 gallons of fuel by reducing vehicle miles traveled of 10 University of Idaho employees. We also have one City of Moscow employee riding the van.
Donn Thill and Josh Peak	Dept. of Weed Science	Composting animal and food waste.	Reduce materials transported to landfill.
Barry Willis	Dept. of Engineering	Linked UI - WSU Classroom (EP 205)	Students and faculty who were driving between Moscow and Pullman to attend jointly offered courses and meetings between the University of Idaho and WSU are now able to view selected meetings and courses in web linked classrooms developed especially for this purpose. Engineering Outreach developed and funded the College of Engineering's classroom (EP205). A similar room was designated for this purpose at WSU. The rooms are linked using excess bandwidth provided to Idaho and WSU by Qwest. The connected rooms will reduce the need for transportation between the campuses, reducing carbon emissions into the atmosphere.

FACULTY MEMBER/ INSTRUCTOR	DEPARTMENT	OUTREACH PROGRAM/ PROJECT NAME	RELEVANCE TO CLIMATE CHANGE
Cheyney, Charles	Extension	Lost Rivers Grazing Academy	Well-managed irrigated pastures sequester 30% more carbon than annual irrigated crop land and utilize much lower levels of manufactured inputs requiring fuel for manufacture and transportation. Irrigated pastures in the Pacific NW are expected to sequester 33,000 lbs more carbon over their life time than annual irrigated crops.

APPENDIX E – UNIVERSITY OF IDAHO CAMPUS BUILDINGS



SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
MOSC	MOSCOW	96	PRITCHARD GALLERY
MOSC	MOSCOW	667	LETTERS ARTS SOCIAL SCIENCES ANNEX
MOSC	MOSCOW	686	TWIN LARCH SANCTUARY
NFAR	MOSCOW - NORTH FARM	70	PUMPHOUSE 3
NFAR	MOSCOW - NORTH FARM	89	PUMPHOUSE 4
NFAR	MOSCOW - NORTH FARM	92	MILKING PARLOR
NFAR	MOSCOW - NORTH FARM	113	MANIS ENTOMOLOGY RESEARCH LAB
NFAR	MOSCOW - NORTH FARM	120	SHEEP BARN #1
NFAR	MOSCOW - NORTH FARM	330	FARM RESIDENCE - DAIRY
NFAR	MOSCOW - NORTH FARM	331	SCALE HOUSE
NFAR	MOSCOW - NORTH FARM	332	MILLING ROOM
NFAR	MOSCOW - NORTH FARM	333	MIXING ROOM
NFAR	MOSCOW - NORTH FARM	334	FEED STORAGE
NFAR	MOSCOW - NORTH FARM	335	CALF BARN
NFAR	MOSCOW - NORTH FARM	336	LOAFING BARN
NFAR	MOSCOW - NORTH FARM	337	DRY COW SHELTER
NFAR	MOSCOW - NORTH FARM	338	HAY SHED
NFAR	MOSCOW - NORTH FARM	339	HEIFER BARN
NFAR	MOSCOW - NORTH FARM	340	COMMODITY BUILDING
NFAR	MOSCOW - NORTH FARM	341	MATERNITY/RESEARCH BARN
NFAR	MOSCOW - NORTH FARM	342	FEEDING BARN #1
NFAR	MOSCOW - NORTH FARM	343	FEEDING BARN #2
NFAR	MOSCOW - NORTH FARM	344	FEEDING BARN #3
NFAR	MOSCOW - NORTH FARM	345	UPRIGHT SILO
NFAR	MOSCOW - NORTH FARM	346	DAIRY PUMPHOUSE
NFAR	MOSCOW - NORTH FARM	350	SHEEP SHELTER 301
NFAR	MOSCOW - NORTH FARM	351	SHEEP SHELTER 302

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
NFAR	MOSCOW - NORTH FARM	352	SHEEP SHELTER 304
NFAR	MOSCOW - NORTH FARM	353	SHEEP SHELTER 305A
NFAR	MOSCOW - NORTH FARM	354	SHEEP SHELTER 306
NFAR	MOSCOW - NORTH FARM	355	SHEEP SHELTER 307
NFAR	MOSCOW - NORTH FARM	356	SHEEP SHELTER 308
NFAR	MOSCOW - NORTH FARM	357	LAMBING BARN
NFAR	MOSCOW - NORTH FARM	358	SHEEP BARN #2
NFAR	MOSCOW - NORTH FARM	359	FARM RESIDENCE - SHEEP
NFAR	MOSCOW - NORTH FARM	360	FARM STORAGE BUILDING #3
NFAR	MOSCOW - NORTH FARM	361	SHEEP WORKING FACILITIY
NFAR	MOSCOW - NORTH FARM	362	FUEL STORAGE SCALE HOUSE
NFAR	MOSCOW - NORTH FARM	363	MANIS LAB GARAGE
NFAR	MOSCOW - NORTH FARM	364	MANIS LAB STORAGE BUILDING
NFAR	MOSCOW - NORTH FARM	366	MANIS LAB STORAGE SHED 1
NFAR	MOSCOW - NORTH FARM	367	MANIS LAB STORAGE SHED 2
NFAR	MOSCOW - NORTH FARM	368	MANIS LAB STORAGE SHED 3
NFAR	MOSCOW - NORTH FARM	369	MANIS LAB STORAGE SHED 4
NFAR	MOSCOW - NORTH FARM	370	MANIS LAB STORAGE SHED 5
NFAR	MOSCOW - NORTH FARM	398	MANIS LAB STORAGE SHED 6
OCAM	MOSCOW - ON CAMPUS	1	ADMINISTRATION BUILDING
OCAM	MOSCOW - ON CAMPUS	3	ART & ARCHITECTURE NORTH
OCAM	MOSCOW - ON CAMPUS	4	ARCHIE PHINNEY HALL (FOCW)
OCAM	MOSCOW - ON CAMPUS	5	FOOD RESEARCH CENTER
OCAM	MOSCOW - ON CAMPUS	6	GRADUATE ART STUDIO (GAS HOUSE)
OCAM	MOSCOW - ON CAMPUS	7	CONTINUING EDUCATION BLDG
OCAM	MOSCOW - ON CAMPUS	9	GIBB HALL
OCAM	MOSCOW - ON CAMPUS	10	ALUMNI CENTER
OCAM	MOSCOW - ON CAMPUS	11	POWER PLANT
OCAM	MOSCOW - ON CAMPUS	12	STUDENT HEALTH CENTER
OCAM	MOSCOW - ON CAMPUS	14	MENARD LAW BUILDING
OCAM	MOSCOW - ON CAMPUS	15	MEMORIAL GYM
OCAM	MOSCOW - ON CAMPUS	16	ART & ARCHITECTURE BUILDING
OCAM	MOSCOW - ON CAMPUS	17	MORRILL HALL
OCAM	MOSCOW - ON CAMPUS	18	RIDENBAUGH HALL
OCAM	MOSCOW - ON CAMPUS	19	LIFE SCIENCES SOUTH

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
OCAM	MOSCOW - ON CAMPUS	20	STUDENT UNION & FINANCIAL AID
OCAM	MOSCOW - ON CAMPUS	21	CAROL RYRIE BRINK HALL (FOCE)
OCAM	MOSCOW - ON CAMPUS	22	ART & ARCHITECTURE SOUTH
OCAM	MOSCOW - ON CAMPUS	25	AG SCIENCE (INCLUDING NEW WING)
OCAM	MOSCOW - ON CAMPUS	26	HAMPTON MUSIC BUILDING
OCAM	MOSCOW - ON CAMPUS	28	JANSSEN ENGR CLASSROOM BLDG
OCAM	MOSCOW - ON CAMPUS	30	NICCOLLS HOME ECONOMICS BLDG
OCAM	MOSCOW - ON CAMPUS	32	LIBRARY
OCAM	MOSCOW - ON CAMPUS	34	STEEL HOUSE
OCAM	MOSCOW - ON CAMPUS	35	J.W. MARTIN LAB
OCAM	MOSCOW - ON CAMPUS	36	RADIO-TV CENTER
OCAM	MOSCOW - ON CAMPUS	38	MINES BUILDING
OCAM	MOSCOW - ON CAMPUS	39	MCCONNELL HALL
OCAM	MOSCOW - ON CAMPUS	41	SHOUP HALL
OCAM	MOSCOW - ON CAMPUS	42	TARGHEE HALL
OCAM	MOSCOW - ON CAMPUS	43	COLLEGE OF EDUCATION BUILDING
OCAM	MOSCOW - ON CAMPUS	44	INDUSTRIAL ARTS BUILDING
OCAM	MOSCOW - ON CAMPUS	46	CAMPUS POLICE SUBSTATION
OCAM	MOSCOW - ON CAMPUS	47	RENFREW HALL (PHYS SC)
OCAM	MOSCOW - ON CAMPUS	48	OFFICE OF DEVELOPMENT
OCAM	MOSCOW - ON CAMPUS	49	ENGINEERING ANNEX
OCAM	MOSCOW - ON CAMPUS	50	EXECUTIVE RESIDENCE
OCAM	MOSCOW - ON CAMPUS	52	THEOPHILUS TOWER
OCAM	MOSCOW - ON CAMPUS	53	SWIMMING CENTER
OCAM	MOSCOW - ON CAMPUS	54	BUCHANAN ENGINEERING LAB
OCAM	MOSCOW - ON CAMPUS	55	COLLEGE OF NATURAL RESOURCES BLDG
OCAM	MOSCOW - ON CAMPUS	56	PHYSICAL EDUCATION BLDG
OCAM	MOSCOW - ON CAMPUS	59	GOLF CART STORAGE SHED
OCAM	MOSCOW - ON CAMPUS	60	HUMAN RESOURCES & PURCHASING
OCAM	MOSCOW - ON CAMPUS	61	ENVIRONMENTAL HEALTH & SAFETY
OCAM	MOSCOW - ON CAMPUS	62	SOUTH HILL COMMUNITY CENTER
OCAM	MOSCOW - ON CAMPUS	65	HARTUNG THEATRE
OCAM	MOSCOW - ON CAMPUS	66	PUMPHOUSE 2
OCAM	MOSCOW - ON CAMPUS	81	AQUACULTURE INSTITUTE
OCAM	MOSCOW - ON CAMPUS	82	FEED & STORAGE POULTRY 1

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
OCAM	MOSCOW - ON CAMPUS	83	LONGHOUSE
OCAM	MOSCOW - ON CAMPUS	84	CAGE HOUSE
OCAM	MOSCOW - ON CAMPUS	85	ARBORETUM BARN
OCAM	MOSCOW - ON CAMPUS	86	EXP SOLAR LAYING HOUSE POULT 5
OCAM	MOSCOW - ON CAMPUS	87	POULTRY-BREEDER
OCAM	MOSCOW - ON CAMPUS	88	ROCK LAB - GEOLOGY
OCAM	MOSCOW - ON CAMPUS	90	AGRICULTURAL PUBLICATIONS
OCAM	MOSCOW - ON CAMPUS	93	BUSINESS TECHNOLOGY INCUBATOR
OCAM	MOSCOW - ON CAMPUS	94	EARLY CHILDHOOD LRNG CENTER
OCAM	MOSCOW - ON CAMPUS	97	IDAHO COMMONS
OCAM	MOSCOW - ON CAMPUS	99	GREENHOUSE (W 6TH STR) 4 UNITS
OCAM	MOSCOW - ON CAMPUS	100	GOLF CLUBHOUSE
OCAM	MOSCOW - ON CAMPUS	104	NATIVE AMERICAN/MIGRANT ED CTR
OCAM	MOSCOW - ON CAMPUS	106	ART & ARCHITECTURE INTERIOR DESIGN
OCAM	MOSCOW - ON CAMPUS	107	NAVY BUILDING
OCAM	MOSCOW - ON CAMPUS	110	MCCLURE HALL
OCAM	MOSCOW - ON CAMPUS	111	ENGINEERING/PHYSICS BLDG
OCAM	MOSCOW - ON CAMPUS	114	ASUI-KIBBIE ACTIVITY CENTER
OCAM	MOSCOW - ON CAMPUS	115	TRACK STORAGE & RESTROOMS
OCAM	MOSCOW - ON CAMPUS	116	WICKS FIELD STORAGE & RESTROOM
OCAM	MOSCOW - ON CAMPUS	118	NORTH CAMPUS CENTER
OCAM	MOSCOW - ON CAMPUS	119	GOLF COURSE STORAGE BLDG
OCAM	MOSCOW - WEST FARM	126	OBSERVATORY
OCAM	MOSCOW - ON CAMPUS	143	STUDENT RECREATION CENTER
OCAM	MOSCOW - ON CAMPUS	147	AG EXTENSION & ED BUILDING
OCAM	MOSCOW - ON CAMPUS	275	BOOKSTORE/US POST OFFICE
OCAM	MOSCOW - ON CAMPUS	403	UNIVERSITY RECYCLING
OCAM	MOSCOW - ON CAMPUS	404	FACILITIES GARAGE
OCAM	MOSCOW - ON CAMPUS	405	LES SMALL ENGINE SHOP
OCAM	MOSCOW - ON CAMPUS	406	UNIVERSITY VEHICLE STORAGE
OCAM	MOSCOW - ON CAMPUS	407	PUMPHOUSE 9
OCAM	MOSCOW - ON CAMPUS	420	RECYCLING / SURPLUS
OCAM	MOSCOW - ON CAMPUS	421	ART & ARCHITECTURE EAST
OCAM	MOSCOW - ON CAMPUS	422	AGRICULTURAL BIOTECHNOLOGY BUILDING
OCAM	MOSCOW - ON CAMPUS	423	GAUSS-JOHNSON ENGINEERING LAB

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
OCAM	MOSCOW - ON CAMPUS	424	J. A. ALBERTSON
OCAM	MOSCOW - ON CAMPUS	500	SOUTH HILL TERRACE- 418 TAYLO
OCAM	MOSCOW - ON CAMPUS	501	SOUTH HILL TERRACE- 426 TAYLO
OCAM	MOSCOW - ON CAMPUS	502	SOUTH HILL TERRACE- 430 TAYLO
OCAM	MOSCOW - ON CAMPUS	503	SOUTH HILL TERRACE- 458 TAYLO
OCAM	MOSCOW - ON CAMPUS	504	SOUTH HILL TERRACE- 464 TAYLO
OCAM	MOSCOW - ON CAMPUS	505	SOUTH HILL TERRACE- 470 TAYLO
OCAM	MOSCOW - ON CAMPUS	506	SOUTH HILL TERRACE- 486 TAYLO
OCAM	MOSCOW - ON CAMPUS	507	SOUTH HILL TERRACE- 492 TAYLO
OCAM	MOSCOW - ON CAMPUS	508	SOUTH HILL APTS - 506 TAYLOR
OCAM	MOSCOW - ON CAMPUS	509	SOUTH HILL APTS - 510 TAYLOR
OCAM	MOSCOW - ON CAMPUS	510	SOUTH HILL APTS - 528 TAYLOR
OCAM	MOSCOW - ON CAMPUS	511	SOUTH HILL APTS - 524 TAYLOR
OCAM	MOSCOW - ON CAMPUS	512	SOUTH HILL APTS - 514 TAYLOR
OCAM	MOSCOW - ON CAMPUS	513	SOUTH HILL APTS - 518 TAYLOR
OCAM	MOSCOW - ON CAMPUS	514	SOUTH HILL APTS - 1020 DEAKIN
OCAM	MOSCOW - ON CAMPUS	515	SOUTH HILL APTS - 1011 DEAKIN
OCAM	MOSCOW - ON CAMPUS	516	SOUTH HILL APTS - 1012 DEAKIN
OCAM	MOSCOW - ON CAMPUS	517	SOUTH HILL APTS - 1016 DEAKIN
OCAM	MOSCOW - ON CAMPUS	518	SOUTH HILL APTS - 1010 DEAKIN
OCAM	MOSCOW - ON CAMPUS	519	SOUTH HILL APTS - 1006 DEAKIN
OCAM	MOSCOW - ON CAMPUS	520	SOUTH HILL APTS - 425 SWEET
OCAM	MOSCOW - ON CAMPUS	530	SOUTH HILL VISTA - 301 SWEET
OCAM	MOSCOW - ON CAMPUS	531	SOUTH HILL VISTA - 303 SWEET
OCAM	MOSCOW - ON CAMPUS	532	SOUTH HILL VISTA - 307 SWEET
OCAM	MOSCOW - ON CAMPUS	533	SOUTH HILL VISTA - 311 SWEET
OCAM	MOSCOW - ON CAMPUS	534	SOUTH HILL VISTA - 315 SWEET
OCAM	MOSCOW - ON CAMPUS	535	SOUTH HILL VISTA - 319 SWEET
OCAM	MOSCOW - ON CAMPUS	536	SOUTH HILL VISTA - 380 TAYLOR
OCAM	MOSCOW - ON CAMPUS	537	SOUTH HILL VISTA - 374 TAYLOR
OCAM	MOSCOW - ON CAMPUS	538	SOUTH HILL VISTA - 354 TAYLOR
OCAM	MOSCOW - ON CAMPUS	539	SOUTH HILL VISTA - 350 TAYLOR
OCAM	MOSCOW - ON CAMPUS	540	SOUTH HILL VISTA - 342 TAYLOR
OCAM	MOSCOW - ON CAMPUS	541	SOUTH HILL VISTA - 334 TAYLOR
OCAM	MOSCOW - ON CAMPUS	542	LIVING LEARNING COMMUNITY BLDG #1

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
OCAM	MOSCOW - ON CAMPUS	543	LIVING LEARNING COMMUNITY BLDG #2
OCAM	MOSCOW - ON CAMPUS	544	LIVING LEARNING COMMUNITY BLDG #3
OCAM	MOSCOW - ON CAMPUS	545	LIVING LEARNING COMMUNITY BLDG #4
OCAM	MOSCOW - ON CAMPUS	546	LIVING LEARNING COMMUNITY BLDG #5
OCAM	MOSCOW - ON CAMPUS	547	LIVING LEARNING COMMUNITY BLDG #6
OCAM	MOSCOW - ON CAMPUS	548	LIVING LEARNING COMMUNITY BLDG #7
OCAM	MOSCOW - ON CAMPUS	549	LIVING LEARNING COMMUNITY BLDG #8
OCAM	MOSCOW - ON CAMPUS	550	WALLACE RESIDENCE- COMMON
OCAM	MOSCOW - ON CAMPUS	551	WALLACE RESIDENCE- STEVENSON
OCAM	MOSCOW - ON CAMPUS	552	WALLACE RESIDENCE- BALLARD
OCAM	MOSCOW - ON CAMPUS	553	WALLACE RESIDENCE- WILLEY
OCAM	MOSCOW - ON CAMPUS	554	WALLACE RESIDENCE- GOODING
OCAM	MOSCOW - ON CAMPUS	569	ELMWOOD APARTMENTS
OCAM	MOSCOW - ON CAMPUS	570	GRADUATE STDT RESIDENCE
OCAM	MOSCOW - ON CAMPUS	678	TEACHING & LEARNING CENTER
OCAM	MOSCOW - ON CAMPUS	680	POULTRY HILL WAREHOUSE
OCAM	MOSCOW - ON CAMPUS	687	NIATT CCVT STORAGE BUILDING
OCAM	MOSCOW - ON CAMPUS	688	CHEMICAL STORAGE
OCAM	MOSCOW - ON CAMPUS	689	FACILITIES SERVICES
OCAM	MOSCOW - ON CAMPUS	690	FACILITIES LATHHOUSE/GREENHOUSE
OCAM	MOSCOW - ON CAMPUS	691	FACILITIES STORAGE
OCAM	MOSCOW - ON CAMPUS	695	CAMPUS STORAGE #1
OCAM	MOSCOW - ON CAMPUS	771	RECLAIM WATER CHLORINATION BLD
PARK	MOSCOW - PARKER FARM	133	PF--PLANT SCIENCE AGRONOMY SEED ST
PARK	MOSCOW - PARKER FARM	134	PF--PLANT SCIENCE GREENHOUSE #1
PARK	MOSCOW - PARKER FARM	135	PF--PLANT SCIENCE SEED HOUSE
PARK	MOSCOW - PARKER FARM	136	NATURAL RESOURCES MICROPROP. LAB
PARK	MOSCOW - PARKER FARM	137	PF--NATURAL RESOURCES GREENHOUSE #1
PARK	MOSCOW - PARKER FARM	138	PF--PCF PUMPHOUSE
PARK	MOSCOW - PARKER FARM	139	PF--PLANT SCIENCE FARM HOUSE
PARK	MOSCOW - PARKER FARM	141	PF--PLANT SCI AGRONOMY STOR/GARAGE
PARK	MOSCOW - PARKER FARM	145	PF--PLANT SCIENCE FARM SHOP
PARK	MOSCOW - PARKER FARM	146	PF--PLANT SCIENCE MACHINE SHED
PARK	MOSCOW - PARKER FARM	347	NATURAL RESOURCES STOR/COLD STORAGE
PARK	MOSCOW - PARKER FARM	348	NATURAL RES. MICROPROP. GREENHOUSE

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
PARK	MOSCOW - PARKER FARM	349	NATURAL RESOURCES GREENHOUSE #2
PARK	MOSCOW - PARKER FARM	371	NATURAL RESOURCES OFFICE/RES LAB
PARK	MOSCOW - PARKER FARM	372	PF--NATR'L RESOURCES GREENHOUSE #3
PARK	MOSCOW - PARKER FARM	373	PF--PLANT SCIENCE SEED STORAGE
PARK	MOSCOW - PARKER FARM	374	PF--NATURAL RES. VEHICLE COMPOUND
PARK	MOSCOW - PARKER FARM	394	PF--PLANT SCIENCE GREENHOUSE #2
PARK	MOSCOW - PARKER FARM	395	PF--PLANT SCIENCE GREENHOUSE #3
PARK	MOSCOW - PARKER FARM	396	PF--PLANT SCIENCE GREENHOUSE #4
PARK	MOSCOW - PARKER FARM	413	FISH & WILDLIFE STORAGE FACILITY
PARK	MOSCOW - PARKER FARM	414	NATURAL RESOURCES GENERAL STORAGE
SFAR	GENESEE - SOUTH FARM	470	KAMBITSCH FARMHOUSE
SFAR	GENESEE - SOUTH FARM	471	GARAGE (N)
SFAR	GENESEE - SOUTH FARM	472	GARAGE (S)
SFAR	GENESEE - SOUTH FARM	474	PUMPHOUSE
SFAR	GENESEE - SOUTH FARM	571	GENESEE PESTICIDE STORAGE
SFAR	GENESEE - SOUTH FARM	679	KAMBITSCH METAL SHOP BUILDING
WFAR	MOSCOW - WEST FARM	33	HOLM CENTER
WFAR	MOSCOW - WEST FARM	58	ANIMAL PAVILION & MEATS LAB
WFAR	MOSCOW - WEST FARM	63	AQUACULTURE WET LAB
WFAR	MOSCOW - WEST FARM	64	PUMPHOUSE 5
WFAR	MOSCOW - WEST FARM	72	FARM RESIDENCE - BEEF
WFAR	MOSCOW - WEST FARM	73	FARM OPERATIONS SHOP
WFAR	MOSCOW - WEST FARM	74	BEEF BARN 1
WFAR	MOSCOW - WEST FARM	75	BEEF BARN 2
WFAR	MOSCOW - WEST FARM	76	BEEF SHELTER 212
WFAR	MOSCOW - WEST FARM	77	BEEF SHELTER 214A / DRY HEIFER SHED
WFAR	MOSCOW - WEST FARM	78	FARM STORAGE BUILDING #1
WFAR	MOSCOW - WEST FARM	79	USDA RESEARCH BARN
WFAR	MOSCOW - WEST FARM	80	FARM STORAGE BUILDING #2
WFAR	MOSCOW - WEST FARM	91	JACOB MONSON MEMORIAL BARN
WFAR	MOSCOW - WEST FARM	122	BEEF BARN 3
WFAR	MOSCOW - WEST FARM	123	VT. SCI. RESEARCH BARN/CATTLE ISOLA
WFAR	MOSCOW - WEST FARM	124	SHAVINGS SHED
WFAR	MOSCOW - WEST FARM	125	HAZARDOUS MATERIALS STORAGE
WFAR	MOSCOW - WEST FARM	129	BEEF WORKING FACILITY

SITE	SITE DESCRIPTION	BLDG NO	DESCRIPTION
WFAR	MOSCOW - WEST FARM	130	METABOLISM/SURGERY BUILDING
WFAR	MOSCOW - WEST FARM	132	PESTICIDE STORAGE
WFAR	MOSCOW - WEST FARM	144	IRRIGATION SYSTEM PUMPHOUSE
WFAR	MOSCOW - WEST FARM	375	BEEF SHELTER 215
WFAR	MOSCOW - WEST FARM	376	BEEF SHELTER 214B
WFAR	MOSCOW - WEST FARM	377	BEEF SHELTER 216
WFAR	MOSCOW - WEST FARM	378	BEEF SHELTER 213
WFAR	MOSCOW - WEST FARM	379	TRUCK SHED
WFAR	MOSCOW - WEST FARM	380	SEED ROOM
WFAR	MOSCOW - WEST FARM	381	MACHINE SHED
WFAR	MOSCOW - WEST FARM	382	RODEO TEAM HORSE SHELTER #1
WFAR	MOSCOW - WEST FARM	383	RODEO TEAM HORSE SHELTER #2
WFAR	MOSCOW - WEST FARM	384	ISOLATION BARN
WFAR	MOSCOW - WEST FARM	385	ISOLATION HOUSE #1
WFAR	MOSCOW - WEST FARM	386	ISOLATION HOUSE #2
WFAR	MOSCOW - WEST FARM	387	ISOLATION HOUSE #3
WFAR	MOSCOW - WEST FARM	388	ISOLATION HOUSE #4
WFAR	MOSCOW - WEST FARM	389	MONSON WORKING FACILITY
WFAR	MOSCOW - WEST FARM	390	USDA INCINERATOR
WFAR	MOSCOW - WEST FARM	391	USDA SHAVINGS SHED
WFAR	MOSCOW - WEST FARM	392	HORSE SHELTER #2
WFAR	MOSCOW - WEST FARM	393	HORSE SHELTER #1
WFAR	MOSCOW - WEST FARM	399	ANIMAL & VET SCIENCE RESEARCH BARN
WFAR	MOSCOW - WEST FARM	408	WHITE PINE OFFICE SHED
WFAR	MOSCOW - WEST FARM	409	WHITE PINE WORK SHED
WFAR	MOSCOW - WEST FARM	681	RADIATION STORAGE BUILDING
WFAR	MOSCOW - WEST FARM	685	AVS RESEARCH HAY BARN