

**2.13 Conservation Element
Data and Analysis
2010-2020 Campus Master Plan Update**

(a) For each of the resources identified in (1) a) identify existing commercial, recreational, or conservation uses

From the Conservation Element analysis in the Master Plan approved in January 2003 by the UCF Board of Trustees, the following sub-elements were included: Air Quality, Surface Water Quality, Underground and Aboveground Tanks, Toxic Waste and Hazardous Materials, Surface and Groundwater Hydrology. Additionally, though not designated by number, a section on natural areas was included. Little specific, new information on these sub-elements was identified. If there has been no update, readers are referred to the Conservation Element Analysis section from the prior plan.

(b) For each of the resources identified in (1) a) assess the available and practical opportunities and methods for protection or restoration of those resources on University property.

The UCF campus contains an abundance of significant natural resource areas, many of which are protected from future development. Areas of interest include the Arboretum, Lakes Lee and Claire, as well as an extensive forested wetland system within the southeastern portion of the campus, which ultimately outfalls into the Little Econlockhatchee River. This campus was designed around a cypress wetland system located at the center of the campus adjacent to the student union. The majority of the campus development activity occurs around this cypress stand in order to protect the natural beauty of this area.

These areas provide not only habitat to a substantial wildlife population, but also offer attractive campus assets and recreational opportunities. The preservation of both the quantity and quality of these resources is vital to the function of these resources, and to ensure the continued attractiveness of the campus.

The University has independently developed conservation strategies for wetlands, floodplains, mitigation sites, water quality, etc., as the need has arisen over the last twenty years. As a consequence, there are over 320 acres of natural uplands and wetland habitats preserved in conservation easements to the St. Johns River Water Management District. There are over 200 additional acres of natural areas on campus that have verbal commitments for long-term preservation, such as the arboretum and smaller isolated wetland areas. In addition, the campus contains an extensive network of stormwater ponds. These areas, in combination with the large area occupied by wetlands, constitute a large percentage of the land occupied by the UCF campus.

The University should, as a priority, develop a long-term strategy for the conservation and management of these lands. Objectives for this conservation plan should include:

1. Conservation of biodiversity within the myriad of upland and wetland communities on-site,
2. Measures to ensure the ability to manage (preferably including fire) these lands,
3. Ways to capitalize on the research and educational opportunities afforded by these lands,
4. Decisions on how protection will be guaranteed,
5. Ways to capitalize on the recreational community and aesthetic benefits of conservation lands and,
6. Measures to ensure the conservation of a viable, interconnected network of natural lands in perpetuity.

To initiate this plan, the University has proceeded with the following steps:

1. Developed a detailed map of existing conservation lands that depicts natural communities of uplands and wetlands as well as stormwater ponds and lakes,
2. Determined what level of protection for their lands is currently in place (i.e., owned by the St. Johns River Water Management District (SJRWMD), conservation easements in place, verbal commitments for UCF administration, jurisdictional wetlands, etc.),
3. Identified those lands necessary for active use by the arboretum, for stormwater storage, etc.,
4. Mapped the extent of habitat occupied by, and suitable for, protected species,
5. Defined the area within the 100-year floodplain that is occupied by native communities,
6. Mapped the regional linkages of natural communities off of the UCF campus,
7. Assigned a leader to develop the conservation strategy through analysis and consensus among interested parties,
8. Organized a committee that includes representatives from UCF administration, UCF ecologists, environmental interest groups, arboretum personnel, recreation specialists, planners, and others, as appropriate. to outline issues and prepare maps of the overall conservation strategy, and
9. Prepared management plans for the overall proposed conservation plan.

(c) For each of the resources identified in (1) a) identify known sources and rates of discharge or generation of pollution.

1. Air Quality

At this time, there is no available quantitative monitoring data with regard to ambient outdoor air quality on the UCF campus. Ozone alerts for the Central Florida area have been issued by the State Health Department on an occasional basis since the summer of 1998. The University is a small player in terms of overall contribution to smog in our region. However, the institution will assist the Health Department and other agencies whenever possible to address this region-wide issue.

2. Surface Water Quality

Although formal water quality monitoring is not required by a specific regulatory agency, the Environmental Initiative, in coordination with Environmental Health and Safety, has initiated the informal testing of water quality in campus surface waters and compilation of data by students. Data was collected over a 12-month period, beginning in 2007.

The University of Central Florida's water features include approximately ten (10) man-made and natural pond and stream systems. These water bodies are monitored regularly by the Environmental Initiative staff and volunteers to observe the health of each pond. Sampling is done onshore to reduce disturbance caused by a water vessel. The meters that are being used are Oakton conductivity meter, and Oakton PD 300 pH, Oakton dissolved oxygen and temperature meter. Samples are collected at varied depths, depending on the location and access to each water feature.

Measurements for each water body include dissolved oxygen, temperature (both air and water), acidity (pH), conductivity, and turbidity (Table 1).

Table 1: Average Data (at outflow points) for UCF Water Bodies

Surface water	Air Temperature (C)	Water Temperature (C)	pH	D.O. (Mg/l)	Conductivity (μs)	Turbidity-Secchi Depth (m)
Lake Claire	35	25.7	6.9	8.8	222	1.18
4L	34	29.3	6.9	9	264	0.72
1D	27	23.5	7.4	8.6	245	0.95
2H	22	22.9	7.4	9.71	251.4	0.98
2Hx	21	23.6	7.5	8.8	221.5	9.7
3A	23	22.5	7.8	11.64	268.7	9.7
Lake Lee	28	28.5	6.6	8.22	139.3	1.69
4B1	26	28	7.1	8.4	199	1.23
4B2	26	27.5	6.9	8.5	211	1
CREOL	24	19	7.06	8.34	222	1.13
BD	22.5	21.1	1.2	1.2	1.2	1.2

3. Underground and Aboveground Tanks

The University has a number of above-ground storage tanks associated with diesel generators, motor vehicle oils, and used oils. The University's regulated diesel generators have double-walled above-ground fuel tanks as large as 4500 gallons. The oil and used oil storage tanks are also double-walled and range from 250 gallons to 500 gallons. The University remediated and closed several old underground storage tanks in 1990 and the 140,000 gallon above-ground heating oil tank in 2003 (see tanks map in the Data Report). Also shown on this map is the current fuel island that was installed in 1995 at the Facilities & Safety compound. This underground tank has a capacity of 20,000 gallons and is FDEP-compliant.

4. Hazardous Materials and Waste

By virtue of its academic and research activities, the University is a user of hazardous materials. All such materials are carefully monitored and regulated such that there is no indication of any prior or current toxic waste problems on the campus property.

Though there is no specific update, readers are referred to the section on the UCF Environmental Management below.

The Environmental Management Program is responsible for ensuring the University's compliance with local, state, and federal environmental laws and regulations. Areas covered include hazardous materials storage, hazardous waste management, environmental assessments, site remediation, the investigation and cleanup of contaminated media on state-owned property, storage tanks, environmental health, and regulatory monitoring to track changes to environmental regulations as they relate to environmental compliance.

By virtue of its academic and engineering research activities, the University is a user of hazardous materials. All such materials are carefully monitored and regulated such that there is no indication of any prior or current toxic waste problems on the campus property.

With respect to the campus' prior land use history as a rangeland, there is no evidence that cattle dipping vats or arsenic pollution were ever present. Construction debris was also deposited into a small depressional "borrow pit" area located near the east property line of the campus in late 1960 (see the hazmat location map in the Data Report for detail). However, no evidence exists which would indicate that toxic materials were placed in this area as it has since been claimed as a jurisdictional wetland by the SJRWMD. The area was monitored from January 2007 to June 2008 as part of the State Owned Lands

Cleanup Survey. Two contaminants exceeding cleanup criteria were identified during initial monitoring, but concentration declined to below clean-up criteria during monitoring period. A “No Further Action” determination was recommended for the site.

The UCF Department of Environmental Health & Safety (EH&S) is responsible for the safe and legal disposal of all hazardous chemicals and wastes generated by the University. Various campus departments, particularly those involved in engineering, science, or health-related research, generate hazardous waste. EH&S contracts with licensed contractors for final disposal of these wastes, after they are collected, profiled, and safely characterized at the Chemical Storage Building (#48). This building is shown on the attached hazmat map, as is the location of other labs and stores where stocks of hazardous materials are located.

The UCF Chemical Storage Building was built in 1989 at a cost of \$214,500. Its original size was 1,824 GSF. A laboratory addition of 200 square feet was completed in 1994. The Chemical Storage Building is currently on the PECO funded expansion to what is now the Laboratory and Environmental Spp A Building was completed in 2009. This project added 4,500 GSF at a cost of \$2,000,000. The expansion provides storage space for additional materials and waste associated with new research efforts and increased increasing amounts of laboratory space on campus.

Summary of UCF Natural Areas Surveys

As part of a series of ongoing class assignments for a biology graduate course, Landscape Ecology (PCB 5328C), natural areas of the UCF lands were digitized from aerial photographs from 1939, 1967, 1972, 1984, 1994, and 1999. The data from the 1999 map showed 45% of the main 1,415-acre part of the UCF campus (not including the 135-acre MacKay Tract or 218-acre eastern area designated as a golf course in the previous plan) to consist of natural areas. Over half (54.7%) of this area was classified as wetlands (e.g., lakes, pond pine and cypress-dominated communities); the remaining area was uplands (e.g., scrub, sandhill, and pine flatwoods communities).

Also, since the development of the previous plan, multiple natural areas surveys were conducted on campus. The first was conducted from September 2001 to May 2002 and was resurveyed from June through August 2003. The Environmental Initiative has surveyed all the green space on campus semi-annually since 2005. The surveys focused on determining the status, and location (if possible) of endangered, threatened, and invasive exotic species. Gopher tortoises were also included.

As a result of the 2001-2002 study, four endangered and seven threatened plant species were identified and 347 plants species were recorded on campus. As a

result of the 2005-2009 surveys, 14 listed plant species (Table 1), one mammal species (Table 2), three reptilian species (Table 3), and 11 bird species (Table 4) have been recorded and mapped on campus.

Table: 1 University of Central Florida Main Campus Listed Plant Species

Species Name	Common Name	Family	Florida Status
<i>Garberia heterophylla</i>	Gaberia	Asteraceae	T
<i>Tillandsoa fasciculata</i>	Wild Pine	Bromeliaceae	E
<i>Tillandsia utriculata</i>	Giant Wild Pine	Bromeliaceae	E
<i>Centrosema arenicola</i>	Pineland Butterfly Pea	Fabaceae	E
<i>Dicerandra thinicola</i>	Titusville Balm	Lamiaceae	E
<i>Pinguicula caerulea</i>	Blue Butterwort	Lentibulariaceae	T
<i>Pinguicula lutea</i>	Yellow Butterwort	Lentibulariaceae	T
<i>Lilium catesbaei</i>	Pine Lily	Liliaceae	T
<i>Calopogon multiflorus</i>	Grass Pink	Orchidaceae	E
<i>Pteroglossaspis ecristata</i>	Giant Orchid	Orchidaceae	T
<i>Pogonia ophioglossoides</i>	Rose Pogonia	Orchidaceae	T
<i>Sacoila lanceolata</i>	Leafless Beaked Orchid	Orchidaceae	T
<i>Sarracenia minor</i>	Hooded Pitcher Plant	Sarraceniaceae	T

Table 2: University of Central Florida Main Campus Listed Mammal Species

Species Name	Common Name	Family	Florida Status
<i>Sciurus niger shermani</i>	Sherman's Fox Squirrel	Sciuridae	SSC

Table 3: University of Central Florida Main Campus Listed Reptiles Species

Species Name	Common Name	Family	Florida Status
<i>Alligator mississippiensis</i>	American Alligator	Alligatoridae	SSC
<i>Pituophis melanoleucus mugitus</i>	Florida Pine Snake	Colubridae	SSC
<i>Gopherus polyphemus</i>	Gopher Tortoise	Testudinidae	T

Table 4: University of Central Florida Main Campus Listed Bird Species			
Species Name	Common Name	Family	Florida Status
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Accipitridae	T
<i>Pandion haliaetus</i>	Osprey	Accipitridae	SSC
<i>Aramus guarauna</i>	Limpkin	Aramidae	SSC
<i>Egretta caerulea</i>	Little Blue Heron	Ardeidae	SSC
<i>Egretta thula</i>	Snowy Egret	Ardeidae	SSC
<i>Egretta tricolor</i>	Tricolored Heron	Ardeidae	SSC
<i>Mycteria americana</i>	Wood Stork	Ciconiidae	E
<i>Falco sparverius paulus</i>	Southern American Kestrel	Falconidae	T
<i>Grus Canadensis pratensis</i>	Florida Sandhill Crane	Gruidae	T
<i>Eudocimus ablus</i>	White Ibis	Threskiornithid ae	SSC

The UCF Environmental Initiative conducted an invasive species study in 2007-2008 and compiled an invasive species management plan. Invasive species are known to have a wide range of effects on habitats, disturbing the ecosystem's structure and function. Many invasive species have proved extremely difficult or impossible to eradicate and costly to control once established. Thus, stringent measures to avoid unwanted species are justified both ecologically and economically. The University has 53 known species of exotic plants on-site, of which 25 species are listed as Florida Exotic Plant Pest Council (FLEPPC) Category I, ten species as Category II, and the remaining not categorized (table 5). Existence of these species on the site greatly interferes with management goals of the University. Additional data on locations and densities of exotic species is available from the Environmental Initiative.

Table 5: University of Central Florida Exotic Species

Species Name	Common Name	Category	Pop. Status
Ardisia crenate	Coral Ardisia	I	Stable
Asparagus densiflorus	Asparagus Fern	I	Stable
Cinnamomum camphora	Camphor Tree	I	Increasing
Colocasia esculenta	Taro	I	Increasing
Dioscorea bulbifera	Air Potato	I	Increasing
Eichhornia crassipes	Water Hyacinth	I	Stable
Eugenia uniflora	Surinam Cherry	I	Decreasing
Hydrilla verticillata	Hydrilla	I	Stable
Imperata cylindrica	Cogon Grass	I	Increasing
Lantana spp.	Lantana	I	Increasing
Ligustrum sinense	Chinese Privet	I	Stable
Lonicera japonica	Japanese Honeysuckle	I	Stable
Lygodium japonicum	Japanese Climbing Fern	I	Increasing
Lygodium microphyllum	Old World Climbing Fern	I	Increasing
Melia azedarach	Chinaberry	I	Stable
Nandina domestica	Heavenly Bamboo	I	Decreasing
Nephrolepis cordifolia	Boston Fern	I	Stable
Paegeria foetida	Skunk Vine	I	Stable
Panicum repens	Torpedo Grass	I	Stable
Rhoeo spathacea	Oyster Plant	I	Decreasing
Ruellia tweediana	Mexican Petunia	I	Stable
Sapium sebiferum	Chinese Tallow	I	Increasing
Schefflera actinophylla	Umbrella Tree	I	Decreasing
Schinus terebinthifolius	Brazilian Pepper	I	Increasing
Urochloa mutica	Paragrass	I	Stable
Begonia cucullata	Begonia	II	Stable
Cocos plumosa	Queen Palm	II	Stable
Melinis repens	Natal Grass	II	Increasing
Panicum maximum	Guniea Grass	II	Increasing
Ricinus communis	Castor Bean	II	Increasing
Solanum viarum	Tropical Soda Apple	II	Increasing
Sesbania punicea	Purple Sesban	II	Decreasing
Urena lobata	Caesar Weed	II	Increasing
Wedelia trilobata	Wedelia	II	Stable
Xanthosoma sagittifolium	Elephant Ear	II	Decreasing
Albizia julibrissin	Mimosa		Stable
Bambusa spp.	Bamboo		Stable

<i>Canna x generalis</i>	Garden Canna		Stable
<i>Carica papaya</i>	Papaya		Decreasing
<i>Crotalaria spp.</i>	Rattlebox		Stable
<i>Cucurbita sp.</i>	Squash		Decreasing
<i>Enterolobium contortisiliquum</i>	Earpod Tree		Increasing
<i>Gladiolus spp.</i>	Gladiolus		Stable
<i>Gloriosa spp.</i>	Flame Lilly		Stable
<i>Indigofera hirsuta</i>	Hairy Indigo		Stable
<i>Ipomoea spp.</i>	Morning Glory		Decreasing
<i>Ludwigia peruviana</i>	Peruvian Primrose		Stable
<i>Luffa aegyptiaca</i>	Smooth Luffa		Stable
<i>Momordica charantia</i>	Balsam Apple		Decreasing
<i>Musa spp.</i>	Banana		Stable
<i>Nephrolepis biserrata</i>	Fishtail Fern		Stable
<i>Senna occidentalis</i>	Senna		Decreasing
<i>Zingiber spp.</i>	Ginger		Stable

The locations of tortoise burrows were mapped and classified as being active, inactive or old. Active burrows are burrows currently being used as determined by indicators such as footprints, feces, food matter, and habitation. Inactive burrows are burrows not currently inhabited, but retain a complete shaft and open mouth. Old burrows are burrows which the mouth and shaft have collapsed leaving only the mound. The 2008-2009 campus survey found: 135 abandoned, 94 active, and 141 inactive burrows. The majority of the active burrows are located in the Arboretum Natural Areas and in the area south of the softball field. Based on these findings, it is estimated that UCF has a tortoise population of 144.29 individuals. Campus green space will continue to be monitored and surveyed every other year, and reports will be stored with the UCF Environmental Initiative.

5. Surface and Groundwater Hydrology

All surface waters have been mapped by the UCF Environmental Initiative. In addition, current topography maps have been created for the campus

(d) For each of the resources identified in (1) a) assess opportunities or available and practical technologies to reduce pollution or its impacts generated by University activities. Investigation of emerging technologies to address these impacts is encouraged.

Please see answer to question (f) below.

(e) An analysis of current and projected water needs and sources, based on the demand for industrial, agricultural and potable water use and the

quantity and quality available to meet those demands. The analysis should consider existing levels of water conservation, use and protection, and applicable policies of the water management district.

St. Johns River Water Management District has issued Consumptive Use Permit 3202 based on current and projected demands for water throughout 2013. The permit will expire October 14, 2013.

(f) An assessment of opportunities or available and practical technologies to reduce the University's energy consumption. Investigation of emerging technologies (i.e., solar) to address this issue is encouraged.

The University adopted policies in 2008, which outline plans to conserve energy campus wide.

Environmental Performance Evaluation (EPE) for UCF

A. Principal environmental aspects for each life-stage

Stage 1a: Site and Infrastructure Development

All aspects of the development of the site

- Ecological disturbances
- Provisioning of infrastructure
- Slope and drainage modification

Stage 1b: Facility development/ Service provisioning

All aspects of the construction of the building itself

- Choice of materials
- Choice of equipments
- Their delivery to the site
- Techniques and equipment used in construction
- Design of buildings (master planning and architectural elements)
- Site cleanup

Stage 2a: Facility Operations- Indoors

Activities taking place within the facility

- Energy consumption
- Water use
- Choice and use of office supplies
- Choice of food supplies
- Choice and operation of heating, ventilation, and air-conditioning equipment
- Recycling and disposal of paper
- Recycling and disposal of food waste

- Recycling and disposal of other debris

Stage 2b: Facility Operations- Outdoors

Activities taking place outside the facility

- Energy consumption
- Water use
- Maintenance of vegetation and plantings
- Any other activities having potential ecological impact

Stage 3: Facility Refurbishment, Transfer, and Closure

- Refurbishment for new uses
- Recovery of materials; components for reuse/ recycling

Maintenance and Operations Requirements

Background

To help reduce growing energy costs, promote sustainable energy practices and help protect our environment, the University of Central Florida has created an extensive energy policy. The policy will be reviewed periodically, with a goal of continual improvement, as public awareness, management techniques, and technology change. The policy has been developed and will be updated periodically by the Department of Sustainability & Energy Management. The department welcomes comments and suggestions on this policy, and requests that input be submitted to www.energy.ucf.edu.

Maintenance

It is the intent of Physical Plant, Landscape & Natural Resources, and Facilities Planning to adopt and incorporate all aspects of the University of Central Florida's Energy and Sustainability Policy into the ongoing maintenance operations programs within Physical Plant and Landscape & Natural Resources. These programs will include modification and renovation to existing buildings or structures, routine maintenance, preventive maintenance, and capital renewal. Incorporation of this policy will enhance the effective and efficient use of all resources needed for operations.

Operations

All UCF buildings and facilities, regardless of the sources of funding for their operation, will be operated in the most energy efficient manner, without endangering public health and safety, and without diminishing the quality of education, research and service. That said, the goal is to reduce energy consumption by 20% in existing Educational and General facilities within a five year period (no later than 2011). The baseline year will be the 2005-2006 fiscal year. With a 20% reduction in energy consumption, UCF will save more than 32

million kWh annually, resulting in cost avoidance in excess of \$2 million per year (using 2005-2006 energy costs). Additionally, attainment of a 20% reduction in energy consumption will result in annual carbon dioxide emissions being reduced by approximately 50 million lbs. Together, attainment of these goals will both enhance our efforts to achieve energy sustainability and significantly improve our environment.

Indoor Environmental Conditions

To maintain reasonable comfort and lower energy expenditures, the University has established the following standard for cooling, heating, humidity control, and ventilation rates.

OCCUPIED HOURS

- When cooling, normal building temperature setpoints will be 74° F, and, upon request, can be lowered, but not below 70° F. When heating, normal building temperature setpoints will be 68° F, and upon request, can be raised, but not above 70° F.
- Thermostat set points for corridors and large common spaces will be set at 78° F when cooling and 68° F when heating.
- Outdoor air ventilation will be set at ASHRAE 62.1 guidelines or such other higher limits as prescribed by state law or regulations.

UNOCCUPIED HOURS

- When cooling, normal building temperature setpoints will be 82° F (or HVAC OFF), and, upon request, can be lowered, but not below 78° F. When heating, normal building temperature setpoints will be 60° F (or HVAC OFF), and, upon request, can be raised, but not above 68° F.
- Intermittent operation of the A/C system during humid weather conditions on weekends and holiday periods will be permitted to maintain indoor relative humidity control.
- Thermostat setpoints for corridors and large common spaces will be set at 78° F when cooling and 68° F when heating.
- Outdoor air ventilation will be shut OFF. HVAC system start-up will begin 30 to 60 minutes prior to occupancy in order to flush accumulated air contaminants prior to occupancy.

These rules may be relaxed, as necessary, if special operating conditions, such as scientifically critical areas, so require.

Data processing and server rooms are to be conditioned to within 10% of the maximum recommended space temperature, as stated by the original equipment manufacturer. All new data centers located within the range of the central chilled water distribution loop shall have dedicated chilled water fan coil units to provide adequate space conditioning. If a new data center is not located within the

chilled water loop, the space shall be conditioned utilizing a dedicated direct expansion unit without ventilation.

All exterior windows and building doors will be kept closed when cooling systems are operating.

Indoor Lighting

All members of the University community should assume responsibility for turning off lights when leaving a room. Lighting levels inside buildings will always be maintained at an appropriate level in order to ensure security. All lighting, except what is required for security purposes, will be turned off when buildings are unoccupied, such as at the end of the workday. Housekeeping will turn lights back on only for the time actually required for custodial work.

All indoor lighting will be fluorescent or LED type, unless an exemption is specifically authorized for designated low usage fixtures. All indoor lighting levels will be surveyed and recorded. The lighting levels will be adjusted to the appropriate Illumination Engineering Societies' (IES) recommendation for the given task being performed in the space.

Occupancy sensors will be installed in all offices, classrooms, conference rooms and utility rooms to reduce and/or turn off lights in unoccupied areas. New energy saving fixtures, lamps, and ballasts will be used to replace existing, less efficient lighting wherever appropriate. Existing incandescent lamps for general-purpose lighting will be phased out, and future incandescent lamps will not be installed unless exempted for extremely limited and specialized tasks. Personal desktop task lights should be fluorescent or LED type.

Outdoor Lighting

Outdoor lighting levels will always be maintained at an appropriate level in order to ensure security. Outdoor illumination will be high pressure sodium, metal halide, LED, or fluorescent type, with the efficacy of the lighting system being no less than 85 lumens per watt. Outdoor lighting shall be dark-sky compliant, as indicated by manufacturer. Low wattage landscape and step lighting is exempted from the dark-sky requirement. The average lighting level will be two (2) foot candles (FC), and the minimum lighting level will be 1 FC. Purely decorative lights beyond reasonable display lighting, inside or outside, will not be used anywhere on campus.

Convenience Appliance Use

Portable electric heaters and fans are prohibited in UCF facilities, unless specifically required by occupants because of medical conditions, failure of the building heating, ventilating or air conditioning systems, or when building heating,

ventilating or air conditioning systems cannot be adjusted to achieve minimum comfort levels within the provisions established by the indoor environmental conditions requirements. If a member of the campus community feels that a space heater is necessary for adequate warmth, this may indicate that the central heating system needs repair. Physical Plant should be notified through the work order system if the central cooling or heating system is incapable of meeting comfort requirements.

All staff and faculty members are requested not to use personal refrigerators. Departmental refrigerators should be located in common areas, eliminating the need for individual units in personal offices. All other personal appliances, such as coffee pots, clocks, radios, and all other peripheral office items should be kept to a minimum and turned off or unplugged at night and during weekends and holidays. UCF community members are asked to take personal responsibility for turning off and unplugging all appliances when not in use.

Office Equipment

All faculty, staff and students should turn off personal computers when left unoccupied for extended periods of time. Additionally, all personal computers shall be configured to automatically engage low power sleep mode in times of inactivity. Directions for implementation of this procedure are available at www.energy.ucf.edu. All peripheral computer items should be left in the OFF position until needed. Computers should be shut down over the weekends, evenings, and holidays.

All new office equipment must meet or exceed the Energy Star ratings for high efficiency operation. Remaining legacy equipment should be replaced with energy efficient equipment as funding becomes available.

Monitoring of Energy Consumption

Energy conservation programs will be most successful if progress is monitored on a regular basis. Most buildings on campus have metering devices installed. Meter readings can be used to track utility consumption to locate problem areas, as well as to determine if conservation goals are being met.

Additionally, each member of the UCF community has the opportunity to view on-line energy consumption data for specific buildings on campus through the Open Energy Information System. Each new building on campus will include a monitoring system which can be viewed on the Open Energy Information System. The Department of Sustainability & Energy Management will maintain appropriate monitoring of all energy consumption throughout the campus.

Space Scheduling

Scheduling of all spaces on campus is controlled through the Space Resource Allocation Office. During the weekends and holiday periods, there is an opportunity for significant reduction in energy consumption on campus by setting back comfort settings. Buildings which are not occupied should be placed into a set-back mode. In the set-back mode, lighting levels are reduced to minimal safety levels, and set points for cooling, heating, and ventilation systems are adjusted to a less energy intensive level.

The Space Resource Allocation Office shall strive to consolidate classes and meetings to only core campus locations, especially during weekends and holiday periods. Classroom and meeting assignments should be made in such a way as to maximize the use of a few buildings, while leaving the majority of buildings unoccupied and available for set-back conditions.

Alternative Fuel Vehicles

Alternative fuel vehicles (AFVs), as defined by the Energy Policy Act of 1992 (EPA Act), include any dedicated, flexible-fuel, or dual-fuel vehicle designed to operate on at least one alternative fuel. Alternative fuel vehicles come in a variety of vehicle models, such as sedans, pickup trucks, sport utility vehicles, vans, shuttle buses, medium-duty vehicles (such as delivery trucks), heavy-duty buses, and heavy-duty trucks. As vehicles are purchased, the University is required to purchase a new vehicle fleet with at least 75% being alternative fuel vehicles. When replacing existing fleet vehicles or adding to the fleet, the University shall seek out alternative fuel, flex fuel or hybrid fueled vehicles. The Department of Sustainability & Energy Management will maintain a list of appropriate vehicles which meet the State of Florida mandates for such purchases. The list can be found at www.energy.ucf.edu.

Awareness and Education

The Department of Sustainability & Energy Management will foster and support the establishment and continued growth of heightened energy awareness on campus. Educational publications, promotional materials, updated websites, and programs for students, staff and faculty will keep the entire UCF community involved in the ongoing efforts of energy conservation. The department shall solicit and evaluate feedback from faculty, staff and students, to monitor the effects of energy conservation efforts. Training on new energy management concepts and programs will be provided, as necessary.

The Department of Sustainability & Energy Management will maintain the Energy Sustainability Plan, and notify the UCF community when significant changes occur. Submit suggestions for additional energy saving initiatives at www.energy.ucf.edu.

Building Construction and Renovation Requirements

Background

As a leader in higher education, the University of Central Florida has made a commitment to being excellent stewards of environmental resources. The construction of new facilities, renovation of existing facilities, and continued maintenance operations must demonstrate high standards of environmental stewardship. Therefore, the requirements outlined below represent the minimum acceptable standards for any UCF facility in order to achieve desired levels of energy stewardship.

Implementation

It is the responsibility of the architect/engineer (A/E) to insure the requirements established within the "Construction Requirements" of the Energy and Sustainability Policy are achieved. It is expected that the A/E be both knowledgeable of, and in full compliance with, the "Construction Requirements." The A/E should contact the Department of Sustainability & Energy Management to review these requirements and to address any questions.

The A/E should identify and make recommendations to incorporate construction design, techniques, products, or other design or construction related methods and principles, which will further enhance operational sustainability and reduce energy consumption of the construction project. The A/E will forward any recommendations to the Department of Sustainability & Energy Management, which will then coordinate a review with the Vice President (VP) and Associate Vice President (AVP) of Administration and Finance, the Director of Facilities Planning, the Director of Landscape & Natural Resources, the Director of Environmental Health & Safety, and the Director of Physical Plant to determine which recommendations, if any, will be incorporated within the design.

At the completion of schematic design, conceptual design, 50% construction document and 90% construction document phases, the A/E will provide UCF with a comprehensive report detailing the accomplishment of the "Construction Requirements" within each phase of the design process. In preparing the report, the A/E will follow the format provided by Facilities Planning.

The A/E will forward the report to the Department of Sustainability & Energy Management, which will coordinate a review of the report with the VP and AVP of Administration and Finance, the Director of Facilities Planning, the Director of Landscape & Natural Resources, the Director of Environmental Health & Safety, and the Director of Physical Plant. Where the report is incomplete or the "Construction Requirements" are not fully incorporated within the design phase, the A/E will (at their cost) complete the report and make revisions, to the design

phase being reviewed, incorporating any missing items in the “Construction Requirements.”

All new construction shall be registered with the US Green Building Council (USGBC) and meet a minimum Leadership in Energy and Environmental Design (LEED) Silver rating, utilizing the NC 2.2 rating (or the most current). Once the project is completed, it must receive a minimum of Silver certification.

Furthermore, the following LEED credits are required (not optional), as they have been identified as crucial to meeting UCF’s goal to construct more energy efficient and sustainable buildings:

- | | |
|-------------------|---|
| 1. Credit SS 6.1 | Storm water management, rate and quantity |
| 2. Credit SS 6.2 | Storm water management, treatment |
| 3. Credit SS 7.2 | Heat island effect, roof |
| 4. Credit WE 1.1 | Water efficient landscaping |
| 5. Credit WE 1.2 | Water efficient landscaping |
| 6. Credit WE 3.1 | Water use reduction 20% |
| 7. Credit WE 3.2 | Water use reduction 30% |
| 8. Credit EA 1 | Optimize energy (minimum 5 points must be achieved) |
| 9. Credit EA 3 | Additional commissioning |
| 10. Credit EA 5 | Measurement and verification |
| 11. Credit IE 1 | Carbon dioxide monitoring |
| 12. Credit IE 7.1 | Thermal comfort |
| 13. Credit IE 7.2 | Thermal comfort, permanent monitoring |

The remaining credits needed to achieve the Silver rating will be determined by the design team for each project, and approved by the Department of Sustainability & Energy Management.

Physical Plant plays a vital role in the implementation and maintenance of the standards and practices established by the Energy and Sustainability Policy. Inclusion of these standards and practices for design and construction specified within the policy will ensure attainment of energy and sustainability standards throughout the process of building modifications or renovations performed as minor projects or Facilities Improvements projects. The use of proactive routine maintenance, preventive maintenance and capital renewal programs will enhance and continue the benefits derived from energy and sustainability practices incorporated by this policy.

Recommendations

The Master Plan already has all the elements that represent each of the five areas of the built environment identified above. These elements include:

- Built Environment
- Urban Design
- Academic Facilities
- Housing
- Architectural Design Guidelines
- General Infrastructure
- Transportation
- Land Use
- Recreation and Open Space
- Conservation
- Landscape Design Guidelines

The focus needs to be analyzing the five to six major categories of environmental impact for each of these elements. In order to do this, indicators should be established and data continued to be gathered and analyzed. After the analysis, changes in or addition of policies and objectives should be considered.