CHAPTER 4

Communication Resources

The students in CES 301/302 demonstrate their communication skills by using different forms of media to inform the public about the project that was completed. Using media such as newsletters, presentations, public service announcements, press releases, brochures, and flyers are all important to the public. These forms of media are powerful tools that agencies may use to communicate to different stakeholders and can be used to generate interest or action of stakeholders within a community. This chapter includes various communication resources completed by the students. We used several sources to complete this assignment but we primarily worked with:


Below is a complete list of communication resources developed for the project:

Mid Project Presentation
Mid Project Presentation Posters
An Inconvenient Truth Flyer
Green ROUTES Survey Table Tent and Posters
Sustainability Day Flyers and Table Tents
CES Expo Posters
Final Project Presentation
Radio Public Service Announcement
Website: www.colby-sawyer.edu/academic/ces/greenroutes/Index.html
Mid Project Presentation

Green ROUTES
Redirecting Our campUs Toward Environmental Sustainability

CES 301: Community-Based Research Project
BUS/CES 321: Organizations and their Environment
• Sustainability assessment
• Reducing the environmental impact

Sustainability
Redirecting Our campUs Toward Environmental Sustainability

• Living within nature’s limits (IUCN)

• Decision making that integrates environmental, social, and economic opportunities across campus and within the broader community (NACUBO)
Our Vision

- Creating a culture of consciousness
- Reducing environmental footprint

8 Point Work Plan

- Energy
- Purchasing
- Buildings
- Grounds
- Offices
- Student Services
- Dining Services
- Recycling
• Investment Group

• Financial Analysis Group

A sampling of what we have done:

• 6 Stations, 6 minutes for each
  – College Investments
  – Water; toilets & urinals
  – Grounds and Trash Disposal
  – Paper and Printers
  – Energy; Propane & Light bulbs
  – Green Buildings & Current Initiatives
Conclusions

Redirecting Our campus Toward Environmental Sustainability

What should be done

- Implementing green building standards
- Reducing energy and paper consumption
- Utilizing environmental screens for college investments
- Installing low-flow bathroom fixtures
- Revising waste management

Future outlook

Redirecting Our campus Toward Environmental Sustainability

Plans for next semester

- MTVu Grant
- Survey
- Composting
- Recycling
- Dining
- Concrete plan for buildings
- Comprehensive report
Feedback and discussion
Redirecting Our campus Toward Environmental Sustainability

Please contact us with your ideas and suggestions

greenROUTES@colby-sawyer.edu
Mid Project Presentation Posters

Green Building Design
Redirecting Our Campuses Toward Environmental Sustainability

Leadership in Energy and Environmental Design (LEED)

Certification Levels:
- Certified
- Silver
- Gold
- Platinum

Sustainability Requirements:
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation and Design Process

“Green premium” is a term for the cost of building a green building. Because the initial costs are higher, builders and institutions are often discouraged from investing in green design. The important fact often overlooked is that because of the efficiency of energy use in these buildings, the investors will actually save substantially by choosing green design.

Figure A: Factors Discouraging the Construction of Green Buildings

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Construction Costs</td>
<td>60%</td>
</tr>
<tr>
<td>Lack of Awareness of Benefits</td>
<td>64%</td>
</tr>
<tr>
<td>Difficulty Quantifying Benefits</td>
<td>47%</td>
</tr>
</tbody>
</table>

Source: Turner Construction Company 2009 Survey of Green Buildings

When Green ROUTES applied this information to the Ivey Science Center here at Colby-Sawyer, we found that being as the building is 33,000 sq ft, the college would have hypothetically saved over a million dollars over the course of 20 years.

Financial Benefits of Green Buildings
Summary of Findings (per $)

<table>
<thead>
<tr>
<th>Category</th>
<th>20-year Net Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings</td>
<td>$5.60</td>
</tr>
<tr>
<td>Emissions Savings</td>
<td>$1.20</td>
</tr>
<tr>
<td>Water Savings</td>
<td>$0.50</td>
</tr>
<tr>
<td>Operations and Maintenance Safeguards</td>
<td>$8.50</td>
</tr>
<tr>
<td>Productivity and Health Value</td>
<td>$36.60 to $58.50</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$52.50 to $71.00</td>
</tr>
<tr>
<td>Average Extra Cost of Building Green</td>
<td>($3.00 to $5.00)</td>
</tr>
<tr>
<td>Total 20-year Net Benefit</td>
<td>$49.50 to $86.00</td>
</tr>
</tbody>
</table>

Source: Capital E Analysis

Figure B: Health Gains from Improved Indoor Air Quality

<table>
<thead>
<tr>
<th>Source/Measure</th>
<th>Improvement (Air)</th>
<th>Improvement (Dust)</th>
<th>Improvement (Noise)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Removal</td>
<td>42%</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>Energy Saving</td>
<td>42%</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>Water Savings</td>
<td>42%</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>Total Benefit</td>
<td>42%</td>
<td>31%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Carnegie Mellon University Center for Building Performance, 2001

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189
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Paper and Printer Usage

CSC Today

Paper
- CSC currently uses 100% non-recycled paper.
- We use 2,500,000 sheets of paper per year.
- Staff uses 78%.
- Students use 22%.
- 500 sheets of paper equals one ream.
- One ream equals five pounds.
- CSC uses 12 tons per year.
- One ton of paper equals 24 trees.
- It takes 288 trees per year to supply CSC with paper for one year.

Future Upgrades

Paper
- Colby-Sawyer uses 288 trees per year.
- If CSC switched to 100% recycled paper this could significantly reduce our impact on the environment.
- Currently CSC pays $13,632 a year for paper.
- Switching to 100% recycled paper would only cost each student approximately $4 more per year.
- Paper consumption could be significantly reduced if both students and staff were to utilize E-Documents and double sided printing.

Printers
- Colgate has 123 printers.
- Most of them are not energy star.
- Each office has the option of having their own Ink Jet printer.
- Energy Star printers save approximately $30 per year compared to non-Energy Star products.
- The incorporation of Energy Star printers could save enough energy to light an entire home for a full year.

Printers
- Conversion to more double sided network printing could reduce energy and paper use significantly.
- Converting to energy star personal printers.
- Cutting down the number of printers on campus.
- By using less energy we could reduce our carbon footprint greatly.
- www.energystar.gov

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190
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Propane, Light Bulb Energy Efficiency & Savings

Redirecting Our Campuses Toward Environmental Sustainability

Propane Efficiency by Building:

Light Bulb Replacements:

*Compact Fluorescents = Efficient
  uses different method to produce light.

*Incandescent bulbs = Inefficient.
  convert 95% of the energy received
  into heat, 5% into light!

Turnover Rate for Library:
  ➢ Converted 350 - 65 Watt Bulbs
    into 13 Watt Fluorescent Bulbs
    equal to 75% energy reduction.

➢ Savings win first year of replacement was $9,360.00
  Ex: One light bulb running for 4 years, 12 hours a day.

Projects Underway By Facilities - Lighting Replacement:
  Susan Colgate Cleveland Library/Learning Center
  David L. Coffin Field House
  Dan and Kathleen Hogan Sports Center Pool

Compact Fluorescent vs. Incandescent Light Bulbs @ Colby-Sawyer College

Rooke + Lawson Light Fixture Replacement
$1,426.88 Savings Per Building
Total Savings Per Year (Rooke + Lawson) = $2,853.76
Total Potential Savings = $4,513.60
Total KWH Cost (50 Current Bulbs) = $2,795.52
Total KWH Cost (50 New Bulbs) = $1,135.68
Savings = $1,659.84 (Bulbs Alone)

Current Bulbs = 32W T12 Circline
(Approx. Life – 5000 Hrs.)

New Bulbs = PLS 13W CFL
(Approx. Life – 10,000+ Hrs.)
## Water

Redirecting Our CampUs Toward Environmental Sustainability

### Total Cost and Usage:
**Toilets: Based on Student School Year (224 Days)**

- Total High Flow: 119
- Total Low Flow: 131

#### Total Gallons Used:
2,264,908.8

#### Money Spent Per Year:
- Total Cost Per Gallon: 0.017 cents
- Total Cost Per Person: $34.74
- Total Gallon Use Per Person: 2,983.3

- Total High Flow: $28,949.67
- Total Low Flow: $8,635.83

#### Total Cost:
$37,585.50

### What if...?
...The number of high flow toilets was replaced with low flow toilets totaling 250 low flow toilets on campus.

- Total Gallon Use/Day = 4,400
- Total Cost/Day = $73.02
- Total Cost/Year = $16,356
- Savings/Day = $94.78
- Savings/Year = $21,230

   - Average cost of low flow toilet = $300
   - Total Cost to Replace 119 toilets = $35,400

### Options to Consider

#### Replace 26 toilets with 1 gallon urinals...
- Cost of Urinal = $300
- Total Cost = $7,800
- Savings Per Year = $4,527.49

#### Break even point = 386 days

#### Waterless Urinals:
- Cost of Urinal = $400
- Total Cost = $10,400
- Savings Per Year = $5,616.58

#### Break even Point = 415 days!
College Investments

Redirecting Our Campuses Toward Environmental Sustainability

Current Investments

Currently the college has no screening criteria for investments. Some of the dirtiest companies the college now invests in include:

1. Exxon
2. General Electric
3. PepsiCo
4. Carolina Group
5. FedEx

Socially Responsible Investing

Investing in companies which meet a set of criteria, including:

- Governance and director independence and diversity
- Environmental policy and management
- Workplace environment, health and safety
- Regulatory compliance
- Product safety and integrity
- Community relations and social contributions

Winslow Green Small Cap

Average Annual Return 2002-2006: 19.25%

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return 02-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>601.748</td>
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<tr>
<td>Current CSC</td>
<td>661.329</td>
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<tr>
<td>Winslow Green Small Cap (15%)</td>
<td>(60,581)</td>
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</tbody>
</table>

Calvert Large Cap

Average Annual Return 2002-2006: 11.54%

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return 02-06</th>
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</thead>
<tbody>
<tr>
<td>Green</td>
<td>1,293.681</td>
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<tr>
<td>Current CSC</td>
<td>357.071</td>
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<tr>
<td>Calvert Large Cap (11.5%)</td>
<td>935.608</td>
</tr>
</tbody>
</table>

Calvert International Equity

Average Annual Return 2002-2006: 8.13%

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return 02-06</th>
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</thead>
<tbody>
<tr>
<td>Green</td>
<td>1,478.601</td>
</tr>
<tr>
<td>Current CSC</td>
<td>1,544.645</td>
</tr>
<tr>
<td>Calvert Int. Equity (10 &amp; 13%)</td>
<td>(166,044)</td>
</tr>
</tbody>
</table>

PAX World Balance Fund

Average Annual Return 2002-2006: 6.40%

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return 02-06</th>
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</thead>
<tbody>
<tr>
<td>Green</td>
<td>1,068.352</td>
</tr>
<tr>
<td>Current CSC</td>
<td>959.256</td>
</tr>
<tr>
<td>PAX World Balance</td>
<td>109,696</td>
</tr>
</tbody>
</table>

Total gain had four comparable mutual funds the college currently invests in been replaced with four green funds from 02-06 $ 818,078

Winslow

Invests in companies which are Clean or Green

- "Green" companies are solving or addressing an environmental problem.
- "Clean" companies are not focused on an environmental need, but are responsibly managing their environmental impacts.

Calvert

Looks for companies that...

- Practices innovative pollution prevention or natural resource conservation
- Place responsibility for environmental performance
- Disclose sources of environmental risk and liability

PAX

Investment criteria include a company’s...

- Air and water emissions
- Waste reduction
- Use of clean and renewable energy
- Climate change initiatives
- Sustainable development programs
Current Management Practice

- Wheelabrator Technologies Inc. located in Claremont, NH.
- $900 per month for all trash and recycling (excludes 30 yd dumpster)
- 30 yd dumpster - $200 trucking fee & $90 per ton

Suggested Alternative

- Bow or Berlin NH
- $1600 per month for all trash and recycling (excludes 30 yd dumpster)
- 30 yd dumpster - $200 trucking fee & $90 per ton

How can the College avoid generating waste?

- Composting
- Incineration
- Reusing
- Source reduction
- Recycling
Invasive Species and Wildflower Meadows

Redirecting Our campuses Toward Environmental Sustainability

Invasive Species

Goal: An eradication of invasive species and planting of natives species throughout campus

Why: The damage caused by an invasive species, mainly occurs as a result of spreading through the native habitats. The invasive species invade the habitat and out-compete native species. Eradication and education about these species plants, throughout our campus and community is the main goal of this project.

Invasive Species on Campus

Oriental Bittersweet (Celastrus orbiculata)  Winged Burning Bush (Euonymus alata)

Wildflower Meadows

Goal: The creation of Wildflower meadows throughout the campus will create more scenic views and relieve some of the costs and pressure of the lawn maintenance crew. Moreover, the creation of these meadows naturally provides corridors throughout the surrounding area.

<table>
<thead>
<tr>
<th>Three ways to plant</th>
<th>Lush Stand</th>
<th>Average Display</th>
<th>Meadow Look</th>
</tr>
</thead>
<tbody>
<tr>
<td>I pound plants:</td>
<td>1,500 sq. ft.</td>
<td>2,000 sq. ft.</td>
<td>4,000 sq. ft.</td>
</tr>
</tbody>
</table>

Calculations: For one Acre
- 43,000 sq. ft./1,500 sq. ft. = 29.1lb
- Bulk pricing 1 lb. (americanmeadows.com)
  20+ lbs. = $23.95 per lb
*Subtotal: $696.95

Data Still Needed:
- Type of:
  - Grass seed
  - Fertilizer
  - Maintenance equipment
- Average mowing time
- Average monthly basis
An Inconvenient Truth Flyer

Join the CES301 Green ROUTES Team for a showing of "An Inconvenient Truth."

Tuesday, December 3rd at 7PM in the Curtis L. Ivey Science Center Clements Hall

A panel of experts will be on hand for a summary and question session after the showing. Don't miss out!

By far the most terrifying film you will ever see.

For more information contact the Green ROUTES team at:
GreenROUTES@colby-sawyer.edu

"Al Gore strips his presentations of politics, laying out the facts for the audience to draw their own conclusions in a charming, funny and engaging style, and by the end has everyone on the edge of their seats, gripped by his haunting message."

-Davis Guggenheim

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196
CSC Environmental Awareness Survey

Green ROUTES Project Report
Institute for Community and Environment
Colby-Sawyer College

Please complete
Don’t delete

It only takes 10 minutes
Available starting January 29
(Will be sent via email)

CSC Environmental Awareness Survey

The purpose of this survey is to raise awareness of environmental issues, evaluate current knowledge, and to gauge support for environmental initiatives.

This survey is being sent to all students, faculty and staff at CSC.

Available starting January 29 via EMAIL

It only takes 10 minutes of your time To speak your mind

Results will be available to the campus community later this semester

CSC Environmental Awareness Survey

Coming to your email soon!!

If you have any questions about this survey or project GreenROUTES, please contact us at GreenROUTES@colby-sawyer.edu or contact our faculty advisor, Dr. John Cullenwarten, jcullenwarten@colby-sawyer.edu, 526-3793.

Printed on 100% recycled paper
Please Complete—Don’t Delete!

Colby-Sawyer Environmental Awareness Survey!

Available Monday Jan. 29th via EMAIL
It Only Takes 10 Minutes!

Why Take the Survey?
• Gain awareness about environmental issues on campus
• Provide your input for environmental initiatives on campus

Results will be available to the campus community later this semester.

Any questions or comments can be sent to GreenRTUES@colby-sawyer.edu
Green ROUTES Project Report

Green ROUTES Survey Results: Students

Redirecting Our Campuses Toward Environmental Sustainability

➢ 56% are not sure if their computer is set to maximum energy savings

➢ 78% of the students want to switch to 100% Recycled Paper

➢ 78% of Students Recycle

➢ 83% of students want to switch to a double sided printer

“Some type of energy efficient lighting/heating system for the dorms. Students waste all too much energy with these two. Give out a small, but enticing scholarship for green living, and contributions to the cause\effect.”

196 out of 248 students say no to prohibiting the use of personal refrigerators in rooms and offices in order to promote the use of common area refrigerators and greater energy efficiency.

➢ 78% of Students Recycle

“There needs to be a change in the culture of the College Environment. People should be made aware of their impact and how they can change their ways without it being an inconvenience.”

From a different perspective: “Recycling sucks- it is for the suburban middle class to feel good about themselves.”

➢ 53% would be willing to pay an additional $25 a year to support a Green Fund

➢ 80% Agree to using a Reusable Mug

These responses are from the 248 students who responded to the Green ROUTES Survey
Green ROUTES Project Report

Green ROUTES Survey Results: Faculty

Redirecting Our Campuses Toward Environmental Sustainability

Here is how 45 Colby-Sawyer Faculty responded to our survey...

“Ongoing environmental education is vital.”

87% would agree or strongly agree to separate food waste items in the cafeteria to support a composting program.

Out of 45 faculty members, 29 strongly agree, and 11 agree that, over time, we should switch to double sided printing.

56% would be willing to support a $25 payroll deduction to support a green fund at Colby-Sawyer; 29% disagreed or strongly disagreed.

87% would agree or strongly agree to eliminate all disposable Styrofoam and plastic containers from the dining room.

76% do not know if their computers are set for maximum energy savings or not.

91% either agreed or strongly agreed that Colby-Sawyer should set a goal to use alternative energy sources to meet at least 25% of campus energy needs in the next ten years. If costs are neutral or will save money.

98% of respondents have heard of green building design; 36 strongly agree, and 8 agree that Colby-Sawyer should incorporate green design in future buildings on campus.

When asked if Colby-Sawyer should spend an extra $3 per student to switch to 100% recycled paper, 27 out of 45 faculty strongly agreed, 14 agreed, 4 had no opinion, and none disagreed or strongly disagreed.

“Our recycling efforts seem to be lame.”

87% currently make an effort to recycle cans, bottles, and paper on campus.
Green ROUTES Project Report

GreenROUTES Survey Results: Staff
Redirecting Our Campus Toward Environmental Sustainability
Responses from 97 Staff Members

“The school needs to commit to becoming a Green campus”

55% support using alternative energy in the future of the college

“I’d love to see CSC look into offsetting their energy use with green credits”

“Work with a local organic gardener and add these foods to the dining plan”

“I strongly support the composting idea as top priority”

GREEN FUTURE

91% are familiar with green design and green buildings!

“Offer an Environmental Literacy workshop for faculty and staff”

60% agree with incorporating green designs into future construction or renovation projects on campus.

RECYCLING

“The amount of paper used is absolutely obscene”

89% currently participate in recycling of cans, bottles and paper on campus!

39% would like more clearly marked bins on campus

75% would like more bins in more places on campus
Sustainability Day Flyers and Table Tents

Schedule of Events:

• **Who Wastes more food? Men or Women?**  
  Thursday April 12th - Tuesday April 17th  
  Measure food waste against the opposite gender to see which gender produces more food waste.

• **Light Bulb Replacement**  
  Thursday April 12th - Tuesday April 17th  
  Green ROUTES team members will be coming around and swapping out your standard light bulb for energy efficient compact fluorescent bulbs.

• **Reset Your Computer**  
  On Webpage  
  Learn how to set your computer to maximum energy efficiency settings  
  http://www.colby-sawyer.edu/academic/ces/greenroutes/Index.html

• **Reusable Coffee Mugs**  
  Tuesday April 17th – end of the school year  
  The dining hall will be distributing reusable coffee mugs.

• **Green ROUTES Recycled Art Contest**  
  Tuesday April 17th at 3:00 – 4:00pm – Alumni Lounge  
  Using only recyclable materials create a piece of art:  
  • The first 25 entrants receive a prize for signing up  
  • Prizes are $75, $50 and $25 to College Café/Snyders  
  • Judging done by GreenRoutes on creativity, variety of recyclable materials and ability to be recycled after contest  
  • To enter please send email to GreenRoutes@Colby-Sawyer.edu

• **Lights Out Candlelit Dinner**  
  Tuesday April 17th  
  Come to dinner to experience the dining hall lit only by candles!

• **Earth Day Poetry Contest**  
  Tuesday April 17th at 7:30 – Letbridge Lodge  
  Poetry must be environmentally themed and prizes will be awarded  
  Contact Janet St. Laurent Jstlaure@Colby-Sawyer.edu

Brought to you by the Colby-Sawyer Green ROUTES team  
Green ROUTES@colby-sawyer.edu  
Redirecting Our campus Towards Environmental Sustainability
Green ROUTES Project Report
Institute for Community and Environment
Colby-Sawyer College

Colby-Sawyer Green ROUTES
Redirecting Our campus Toward Environmental Sustainability

Sustainability involves:
Living within nature’s limits (IUCN)
Decision making that integrates environmental, social, and economic opportunities across campus and within the broader community (NACUBO)

Please contact us if you want to get involved, have any suggestions, or just want to show us some love!
greenROUTES@colby-sawyer.edu

Sustainability Days
Schedule of Events:

Who Wastes more food? Men or Women? Thursday April 12th -Tuesday April 17th
Reduce your food waste in the cafeteria; all food waste you throw away will be measured against the opposite gender to see which gender produces more food waste.

Light Bulb Replacement – Thursday April 12th --Tuesday April 17th
The Green ROUTES team will swap out standard light bulbs for energy efficient compact fluorescents.

Green ROUTES Recycled Art Contest – Tuesday April 17th at 3:00 – 4:00pm, Alumni Lounge
You may use only recycled materials to create an art piece to enter in the recycled art contest. The first 25 entrants receive a prize just for signing up, and the winning piece will receive a $75 dollar gift certificate, second prize is $50 and third prize is $25. Art pieces will be judged on creativity, variety of recyclable materials used and ability of piece to be broken down and recycled after contest.

Lights Out Candlelit Dinner – Tuesday April 17th
Come to dinner to experience the dining hall lit only by candles!

According to the Green ROUTES survey, 87% of students at Colby-Sawyer are willing to get involved in implementation of new ideas in creating a green campus.

“Sustainability is important in all times. Sustainability is not just a measure of saving or conserving, but it is an approach to life which reflects our respect for ourselves, what we use, and how we live.”
David Sauerwein, Dean of Students

For more information go to:
www.colby-sawyer.edu/academics/greenroutes/index.html
Green ROUTES Project Report

CES Expo Posters

Recent Accomplishments

Redirecting Our CampUs Toward Environmental Sustainability

Food Waste Challenge
Light Bulb Exchange
Sustainability Days

Green ROUTES is a group made up of nine Community Environmental Studies students who have been working all year to compile a Campus Sustainability Assessment.

Through the assessment, we identified ways to conserve energy and lighten the environmental impact of campus activities.

An Inconvenient Truth

Recycled Art Contest
Window and Door Audit

Energy Efficient Windows
Indoor Air Quality Test

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204
Overview:

Several specific analyses of the campus were conducted, which not only create a comprehensive outline of the campus, but also define where improvements and refinements should be made.

Invasive Species:

Plants not native to an area, that out-compete the native species growing and spreading too rapidly. They must be properly removed to ensure health in the natural habitat.

Objectives:
- Education
- Eradication
- Replacement

Wildflower Meadows:

An effective method to reduce an institution’s greenhouse gas emissions. The less land on campus that needs to be mowed, the less gas is used. Plus, wildflower meadows are aesthetically much more appealing than just grass.

Campus Trees:

The Colby-Sawyer campus is used by classes as a laboratory for studying native plant species. Unfortunately, a startling number of the trees are non-native, planted species. Native trees should be planted to replace any tree on campus that dies. Replacing non-natives with natives would solidify the natural habitat on campus, making it a better area for study.

Impervious Surfaces:

An impervious surface is a surface which water cannot penetrate. The most important environmental implication of impervious surfaces is increased runoff, which creates what is known as non-point source pollution. The Colby-Sawyer campus is currently 24.5% impervious surface. Lessening the impervious surface on campus would in turn lessen the school’s environmental impact.

Currently, there is no long term storm water management plan at Colby-Sawyer College.
Priority I: Initiatives for Next Year
Redirecting Our campuses Toward Environmental Sustainability

Invasive Species
Invasive found throughout campus:
Norway Maple Total locations: 24
Japanese Barberry Total locations: 1
Burning Bush Total locations: 20
Multiflora Rose Locations: around Susan Swamp
Purple Loosestrife Locations: around Susan Swamp
Oriental Bittersweet Total locations: 3

Sustainability Day Survey Results
51% of students, 60% of faculty and 77% of staff feel that all students should be required to take an Environmental Literacy Course at the College. 53% of students, 70% of staff, and 64% of faculty are willing to get involved in the implementation of new ideas toward creating a green campus.

<table>
<thead>
<tr>
<th>Food Waste Challenge: Battle of the SEXES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Men: Food Weight</td>
<td>Women: Food Weight</td>
</tr>
<tr>
<td>(total people)</td>
<td>(total people)</td>
</tr>
<tr>
<td>133.6lb</td>
<td>101.2lb</td>
</tr>
<tr>
<td>(624 men)</td>
<td>(1122 women)</td>
</tr>
<tr>
<td>Average/day = 33.4lb</td>
<td>Average/day = 17.8lb</td>
</tr>
<tr>
<td>Per person = 3.4oz</td>
<td>Per person = 2.7oz</td>
</tr>
</tbody>
</table>

Priority I List:
Focus the Nation
Invasive Species Investments Labs Light Bulbs Orientation Refrigerators
Sustainability Coordinator Sustainability Days Tree Inventory Wildflower Meadows Windows Vending Machines Zip Car

Focus The Nation
January 31, 2008:
Over one thousand colleges, universities and high schools as well as political leaders and businesses, faith and civic organizations will participate in a nation-wide, non-partisan discussion on critical policy choices for the next decade.
“Focus the Nation provides an exciting model opportunity to create, for one day, a true national community of scholarship bridging traditional disciplinary boundaries”
Green ROUTES Project Report

Priority II: Initiatives for next 2-3 Years

Redirecting Our Campus Toward Environmental Sustainability

Water: Toilets
Total High Flow (6.1 gal/per flush): 119
Total Flow Per Year: 1,744,512
Cost Per Year: $28,949.67
Total Low Flow (1.6 gal/per flush): 131
Total Flow Per Year: $20,396.8
Cost Per Year: $8,635.83

If all High Flow Toilets were replaced with Low Flow the initially cost would be $55,400, but would save:
Per Day: $94.75
Per student year: $21,224
Toilets would be paid off in 373 Days

Energy Star Printers:
Save $30 a year in energy costs per printer when compared to ordinary printers. They use significantly less amounts of energy, reducing Colby-Sawyer’s carbon footprint greatly.

Double Sided Printers:
Colby-Sawyer College currently has approximately 343 printers in use on campus. If we were to switch to network printers we would need only one or two printers per floor compared to 125, saving money and energy.

Pool Cover:
Would have positive environmental impact by reducing energy needs along with costs. With a thermal pool cover, savings of 50% - 70% are possible. This is around 2,200 dollars a year.

Recycling:
Expand the recycling program currently on campus to include small recycling bins in each dorm room and office group and recycling centers on more floors of dorm and administrative buildings. 60% of students would welcome recycling bins in their dorm room and would be more likely to recycle with these bins.

Green Buildings:
Green building design is a smart thing for Colby-Sawyer to consider and invest in because it would greatly decrease the college’s environmental footprint and at the same time, it would provide huge long-term savings.

Recycled Paper:
If CSC switched to 100% recycled paper it would only cost $4 more per student.

Green Fund:
Green ROUTES’ goal is to develop an Environmental Fund for greening initiatives to improve Colby-Sawyer College’s impact on the environment. 195 out of the 248 students that participated in Green Routes survey question agreed to pay an additional $25 in tuition to establish a Green Fund at Colby-Sawyer.

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Colby-Sawyer College
207
Composting:
An easy way to reduce the amount of solid waste, while creating a valuable resource.

Double Doors:
Implementing a double door system would help to keep a constant temperature inside of buildings, thus causing less warming and cooling of buildings and reducing energy costs.

Impervious Surface:
The amount of impervious surface throughout Colby-Sawyer College can be properly managed by creating a long term management plan that recognizes current pervious areas, and incorporates a resurfacing plan that incorporates porous paving techniques.

Food Service Equipment:
Encourage Colby-Sawyer to only purchase Energy Star products in order to save as much money as possible and lessen the schools ecological footprint on the environment.

Wind Power:
Colby-Sawyer College could help fight climate change and make a commitment to using renewable energy sources by constructing a wind turbine on campus that feeds into the College’s power grid.

Solar Power:
Green ROUTES recommends that Colby-Sawyer College consider setting up some solar panels on campus, perhaps on the roof of the Hogan Sports Center and on the south-facing side of any other roof.
Final Project Presentation

Agenda

- Project Overview
- Define Sustainability
- Explain Campus Sustainability Assessment
- Green Routes Recommendations
  - Priority I
  - Priority II
  - Priority III
- What If....
- Taking Action
Sustainability
Redirecting Our CampUs Toward Environmental Sustainability

- Living within Natures Limits (IUCN)

- Decision making that integrates environmental, social, and economic opportunities across campus and within the broader community (NACUBO)

Process
Redirecting Our CampUs Toward Environmental Sustainability

Planting the ROUTES
Goals
Redirecting Our campus Toward Environmental Sustainability

Possibilities
Issues
Action

Campus Sustainability Assessment
Redirecting Our campus Toward Environmental Sustainability

Campus Sustainability Assessment

Developing Priorities
- Other Educational Institutions
- Community Involvement
- Water and Energy Assessment
Green ROUTES Project Report

Campus Sustainability Assessment
Redirecting Our campuses Toward Environmental Sustainability

Issues

Time line

Survey
• Campus Culture
• Respondents:
  248 students
  97 staff
  45 faculty

Priority I
Redirecting Our campuses Toward Environmental Sustainability

Initiatives for Next Year

• Sustainability Coordinator
• Tree Inventory
• Invasive Species
• Wildflower Meadows
• Light Bulbs
• Labs
• Investments

• Focus the Nation
• Orientation
• Zip Cars
• Refrigerators
  (residence halls)
• Vending Machines
• Sustainability Days
Priority I
Redirecting Our campuses Toward Environmental Sustainability

Initiatives for Next Year

**Sustainability Coordinator:** Adequate staffing is a key issue for campus sustainability efforts.

**Orientation:** Start the Green thoughts early!

**Grounds:**
- *Tree Inventory:* tree wish list
- *Invasive Species:* removal / replacement

Priority I: Investments
Redirecting Our campuses Toward Environmental Sustainability

Analysis By Business 321

**Socially Responsible Investing**
Investing in companies which meet a set of criteria, including:

- Workplace environment, health and safety
- Regulatory compliance
- Product safety and integrity
- Community relations and social contributions
- Governance and director independence and diversity
- Environmental policy and management

$818,078
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Green ROUTES Project Report

Priority II
Redirecting Our Campus Toward Environmental Sustainability

Initiatives for next 2-3 years

• Green Buildings
• Green Fund
• Insulation
• Motion Sensors
• Pool Cover
• Printers – Double Sided
• Printers – Energy Star
• Recycled Paper
• Recycling
• Water

Priority II
Redirecting Our Campus Toward Environmental Sustainability

Initiatives for next 2-3 years

Water: Toilets/Urinals:
1,279,512 gallons/year saved if we switched to all low flow
Cost saved: $21,000

Motion Sensors:
• Saving both money and energy

Green Fund:
• Seed Money for Green Initiatives
Initiatives for 3 years and beyond

- Carbon Offsets
- Composting
- Doors
- Food Services Equipment
- Impervious Surface
- Solar Power
- Wind Power

Composting:
- Reduces Solid Waste

Food Service Equipment:
- Energy Star Products

Wind Power:
- Renewable Energy
Project Green ROUTES

Redirecting Our campuses Toward Environmental Sustainability

What is the issue?

Humankind is rapidly expending Earth’s natural resources

Humankind is not harnessing renewable energy

Our future is one of limited resources

We are permanently damaging the environment and the world we are a part of
Climate Change

Carbon dioxide and other air pollution collects in the atmosphere, trapping the sun’s heat and causing the planet to warm up.

Coal-burning power plants are the largest U.S. source of carbon dioxide pollution -- they produce 2.5 billion tons every year.

Automobiles, the second largest source, create nearly 1.5 billion tons of CO$_2$ annually.

Burning fossil fuels produces harmful greenhouse gasses.
A chunk the size of Rhode Island has broken off the Larsen Ice Shelf in Antarctica.
Rapidly melting sea ice is diminishing polar bear habitat

In February 2007, the IPCC adopted a major assessment of climate change science:

“Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level…”
The report was produced by some 600 authors from 40 countries. Over 620 expert reviewers and a large number of government reviewers also participated. Representatives from 113 governments reviewed and revised the report before adopting it and accepting the underlying report.

PEAK OIL

Many geologists and environmental policy experts warn that we passed peak oil production in 2005 and will face ever increasing shortages in the future (http://www.lifeaftertheoilcrash.net/)
Locally, we place high value on water quality

"The world faces a stark choice -- reduce emissions or face the fury of nature"

Dr. Ute Collier, head of the World Wildlife Fund’s Climate Change Program
Carbon Calculation

Green ROUTES used Clean Air Cool Planet’s carbon calculator to determine how much CO\textsubscript{2} Colby-Sawyer College emits each year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Emissions (Metric Tons CO\textsubscript{2})</th>
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<tbody>
<tr>
<td>2003</td>
<td>5,142</td>
</tr>
<tr>
<td>2004</td>
<td>5,713</td>
</tr>
<tr>
<td>2005</td>
<td>6,671</td>
</tr>
<tr>
<td>2006</td>
<td>6,887</td>
</tr>
</tbody>
</table>

Colby-Sawyer College’s net CO\textsubscript{2} emissions have gone up every year.

The most significant components of our carbon emissions are:

- Electricity
- Heat
- Gasoline
- Student Air Travel
- Waste Disposal
In comparison Middlebury College’s CO$_2$ emissions in 2000 were 35,000 metric tons.

Emissions increased after the construction of new buildings, just like Colby-Sawyer’s.

What IF…

*we bring green initiatives to Colby-Sawyer College*
Actions to be carried out in the years to come

What are the possibilities?

What are the energy savings?

How we can contribute to decreasing our impact on the environment?

What are you willing to do?

Zip Cars
Campus car-sharing program for faculty, staff and students.

Each Zip Car replaces over 20 privately owned cars
Campus vending machines could be replaced with Energy Star models that consume less energy...

...we could do the same with common area refrigerators.
The Hogan Sports Center pool contains 3,375 square feet of water

A pool cover could save 70% of heat loss –

and $3,000 a year in water and heating costs

Paper:
Colby-Sawyer uses over 2.5 million sheets of paper each year

Currently, all of it is 100% NON-recycled
It would only cost approximately $4 per student per year to switch to 100% recycled

77% of students surveyed support this plan

Printers @ Colby-Sawyer

approximately 343 printers are in use on campus not including student personal printers
In Colgate there are 100 rooms and 123 printers.

If we were to switch to network printers we would only need one or two printers per floor compared to 123 - saving money, energy and paper with double-sided printing.
Green Building Design

...doesn’t mean a mud hut
Green Buildings use recycled materials, require less energy and can be pleasant work settings

Recycled Materials:
- Carpets
- Floor Tiles
- Furniture

Green Buildings also use renewable resources

Examples: Natural linoleum flooring and certified wood shingles
Photovoltaic Shingles - converting the sun’s energy into electricity

Wood Beams and Posts - wood fibers that are often wasted during the milling process

A Middlebury common room with *Local* wood products
Solar Panels at Proctor Academy

More double doors would help keep buildings at a constant temperature – saving energy and money
If all high flow toilets were changed to low flow, we would save 1,279,512 gallons of water and $21,000 each year.
Solar Panels and Wind Turbines harness renewable energy!

Incorporating native plant landscaping around buildings provides natural habitat for wildlife and important teaching and learning resources.
Estimated Financial Benefits per Year from Green ROUTES Recommendations

Investments: $200,000  
Water Conservation: $21,000  
Compact Fluorescents: $10,000  
Energy Star Appliances: $10,000  
Light Motion Sensors: $3,000  
Pool Cover: $3,000

Total: $247,000

What You Can Do

Support Green ROUTES Recommendations
- Turn off lights
- Monitor room heating
- Conserve water
- Ride-Share
- Recycle and generate less waste
- Use e-documents and print double sided
- Plant a tree
- Be creative!
- Talk to your friends about Green ROUTES
As global climate change persists and environmental problems intensify worldwide, a new generation of thinkers and activists must rise to address the problem and take the initiative in green building.

A.O. Casale

Works Cited:

“Be the change you wish to see”

Already Accomplished

Future Goals

✓ Website
✓ Library
✓ Symposium Posters

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237
Where do we go from here?
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