

## goBeyond Teach-In Report

October 27 – October 31, 2008

Climate change is a complex and interdisciplinary problem. If we are to successfully reduce our negative impact and generate positive solutions to climate change, we must be bringing together our knowledge on human attitudes and behaviours, ecosystem pathways, alternative energy sources, economics, effective communications, and the expertise of other diverse fields. Post-secondary institutions are in an ideal position to generate solutions for climate change. In order to encourage interdisciplinary collaboration, we decided to initiate a teach-in at these hubs of knowledge and activism.

The purpose of a teach-in is to raise awareness of pressing contemporary or controversial issues – in this case, climate change – in order to stimulate trans-disciplinary discussion and action as well as generate advocacy for effective solutions. As part of goBeyond's Education Pillar, we organized a province-wide teach-in that took place during the last week of October. We were able to rally support and ideas for this event from faculty members and instructors across the province, representing a diverse range of departments and disciplines.

We asked faculty and instructors to devote a minimum of 15 minutes of their lecture to a discussion about climate change issues with their students. The focus of this time was to spark a dialogue that looked at the connections between climate change and the faculty member's discipline or research interests. For example, a psychology class might discuss climate change in relation to behavioural change, and an engineering class might examine their role in creating new innovations in clean energy technology, and how it could be applied to their campus.

goBeyond was pleased with the results, and will be coordinating another teach-in from March 2nd - March 6th, 2009. If you are interested in participating, or would like to be involved in the planning team, please contact [info@campusclimatenetwork.org](mailto:info@campusclimatenetwork.org).

### *The Questions*

Each participating instructor was asked to lead a class discussion which would address the following four questions:

1. *What are the connections between our class and climate change?*
2. *How can our discipline be used to develop solutions for climate change in our community or region?*
3. *Imagine that you have just been hired by your local city or town council to create a public campaign to get local residents to reduce their carbon footprint. What skills can you use from our discipline to help develop the campaign? Describe other disciplines that you would want to collaborate with and why.*

4. *What can our school do to reduce its climate impacts and help develop climate solutions for our community or region?*

The first three of these questions look at how each discipline is uniquely linked to climate change, and what role the class can play in creating local solutions. The last question draws out suggestions for steps each institution to take to reduce its contribution to climate change.

## **The Findings**

The findings are detailed in the Appendix 1: Teach-In Results. However, the primary goal was not the creation of an in-depth report, but to stimulate creative thought throughout the province's post-secondary institutions.

We will be sharing our findings with students and faculty in order to assist them in integrating climate change learning into their classes. In addition, we hope the findings will encourage the use of community-based learning techniques in which classes work to develop and implement the tangible project ideas they came up. It will also enable them to see the responses generated by the disciplines they indicated a desire to collaborate with.

In addition, we will be communicating our results with the Ministry of Advanced Education and the Climate Action Secretariat, to help them in: (a) utilizing education as an asset in reaching the 2010 mandate of carbon-neutral schools, and (b) re-aligning our education to more fully address trans-disciplinary issues such as the climate crisis.

We will share the results of the teach-in back to the aforementioned stakeholders, and we will work with localized groups to build upon the solutions generated by this project.

### *goBeyond Teach-In Reach*

Participation in the teach-in far exceeded our expectations:

- 15 post-secondary institutions
- 21 disciplines<sup>1</sup>
- Over 200 instructors
- 10,000 students (approx.)

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<sup>1</sup> The disciplines represented in the teach-in covered a wide range of the academic and trade spectrum. Sample courses that participated included: Italian 101, Business Planning, Early Canadian History, and Computer Networks.

### *Disciplines' Role in Climate Solutions*

The answers that students provided for the first three questions indicate a relatively high degree of education on the issues surrounding climate change. They also contain a wealth of suggestions for interdisciplinary cooperation and advocacy.

Most classes were able to draw direct links between their disciplines and climate change, as well as provide suggestions for how their particular skills could help develop relevant projects. The question that asked the students to describe other disciplines they would want to collaborate with generated a wide range of responses. This is especially encouraging, as it demonstrates awareness within the student body and faculty of the need to have cross-disciplinary cooperation in order to address the climate crisis.

### *Institutions' Role in Climate Solutions*

The answers that the students provided for the last question are an innovative and broad set of ideas for change that could be implemented by their respective institutions. Responses ranged from the traditional ("Use low-flush toilets."), to the technical ("Reduce the use of water by xeriscaping<sup>2</sup> on campus."), to the creative ("Use people to make power, like in the gym, use treadmills and bikes to [generate] power.")

All of the suggestions were classified into the following categories:

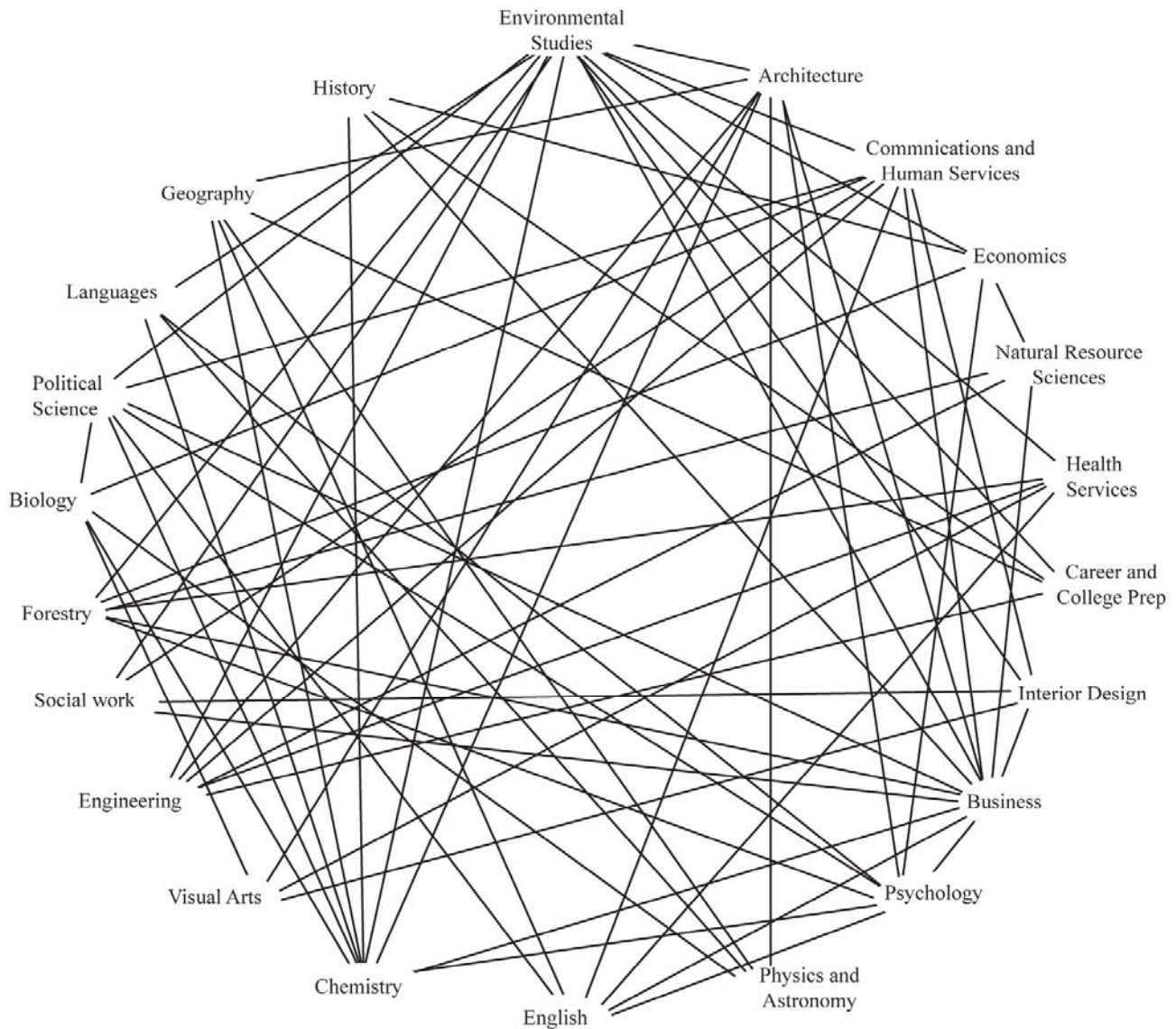
- Food
- Waste
- Transportation
- Energy
- Education/Advocacy
- Other

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<sup>2</sup> Xeriscaping is a gardening technique that involves using native vegetation that does not require additional irrigation.



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**Figure 1: The Collaboration Web.** This image depicts the relationship needed between disciplines in order to create regional climate change solutions, as indicated by the disciplines themselves.

## Potential Collaborative Scenarios

As Figure 1 shows, the desire for interdisciplinary cooperation is very significant. The following two scenarios will take ideas generated by teach-in participants in response to Question 4, and will explore how these could become a reality through interdisciplinary collaboration.

### Scenario I

*“Use people to make power, like in the gym, use treadmills and bikes to [generate] power.”*

**Step 1: Conceptualize it.** This would likely be carried out by the engineering department.

**Step 2: Propose it.** A proposal would be written up by those studying business, with the help of those in english, journalism and communications.

**Step 3: Present it.** The project would be proposed to the institution or any other organizations involved. This proposal would be carried out by a team of students including those studying: business (give presentation), visual arts (create visual aids), environmental studies (show environmental impact), mathematics (calculate energy savings and financial savings).

**Step 4: Design it.** Those studying kinesiology and in the athletics department would be in charge of figuring out which machines to purchase/retrofit. Architecture students would work with engineers to design the physical space.

**Step 5: Build/Retrofit it.** Architects and engineers would work together to build the gym, or retrofit an existing gym.

**Step 6: Publicize it.** Business and english/journalism/communications students would collaborate in publicizing this innovative project.

**Step 7: Run it.** Although campus gyms are not often run by the students themselves, this one could be managed by business and kinesiology students, and the fitness instructors could be kinesiology students themselves.

**Disciplines involved:** Business, Engineering, Journalism, Visual Arts, Environmental Studies, English, Architecture, Kinesiology, Mathematics.

**Stakeholders involved:** Facilities managers, Staff Unions, Student Union, Athletics Department.

### Scenario II

*“Reduce the use of water by xeriscaping on campus.”*

**Step 1: Research it.** In order to figure out which native plants would be best for each campus location, we would rely on the expertise of those in biology, geography, natural resource management, environmental studies and landscaping. Health services students may be interested in creating a medicinal plants garden.

**Step 2: Propose it.** The proposal would be put together by those who identified the plants (see above), those in business and communications (write up and present proposal), visual arts (provide illustrations), and environmental studies (calculate reduction in water use).

**Step 3: Plant it.** The garden would be planted primarily by those in the landscaping program. An interesting addition would be to have education students lead school groups in helping to plant the garden, as a tool for teaching about sustainability and local vegetation.

**Step 4: Promote it.** The xeriscaped garden would be promoted through a series of information signs and posters (designs and content provided by those in visual arts and english/communications, respectively).

**Disciplines involved:** Biology, Geography, Natural Resource Management, Environmental Studies, Landscaping, Health Services, English, Communications, Business, Visual Arts, Education.

**Stakeholders involved:** Facilities management, Staff Unions, Student Union

## The Feedback

The response we have received has been encouraging and supportive. The following quotes exemplify the type of feedback we have been given:

*"We had a lively and informative discussion yesterday in my class. We had a half hour for this, but I quickly realized that students desired, and needed, far more time. Perhaps in the future. Thank you...for this opportunity. I hope this is just the beginning."*

Lee Emery (Thompson Rivers University)

*"Thanks for the opportunity to participate in this initiative. The enthusiasm of my students continues to be an inspiration for me. The class has also drafted a letter based on our response to Question 4, to be forwarded to the institution's Sustainability Committee."*

Dr. Eric Krogh (University of Victoria)

*Thanks for this great and absolutely crucial initiative!*

Anneliese Schultz, Italian 101, UBC

*I would say that the overall experience was both positive and powerful. The videos were very effective and the questions inspired some very constructive conversation... Our discussion moved easily into what can be done locally. This is certainly a meaningful outcome...Keep working towards full integration into all aspects of curriculum in all areas. When our thinking and the questions we ask as part of our daily lives shift then our actions will shift.*

Michelle Nakano, Landscape Practices, Kwantlen

## Appendix: Teach-In Results

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## I. THE QUESTIONS

1. What are the connections between our class and climate change?
2. How can our discipline be used to develop solutions for climate change in our community or region?
3. Imagine that you have just been hired by your local city or town council to create a public campaign to get local residents to reduce their carbon footprint. What skills can you use from our discipline to help develop the campaign? Describe other disciplines that you would want to collaborate with and why.
4. What can our school do to reduce its climate impacts and help develop climate solutions for our community or region?

## II. THE DISCIPLINES

### ARCHITECTURE

#### Architecture

1.
  - Buildings use a lot of energy. Well designed buildings use less energy. As designers we have the ability to affect major change.
2.
  - Sustainable design encourages the use of sustainable materials, decreases the amount of energy a building requires, improves the indoor environment, and includes provisions for broader social sustainability.
3.
  - Research and design skills learned in the Architectural and Engineering Technology Program (ARET) could be used to develop the proposed campaign. Designers from the ARET program could work with builders, other researchers (scientists), artists, and virtually any other discipline in order to accomplish the task of reducing the carbon footprint of the community.

### ARTS

#### English

1.
  - English courses are primarily text-based; we are heavy consumers of paper. Students suggested that use of electronic media should be encouraged, although this can also have negative effects on the environment. Where possible, alternative sources should be substituted (hemp, bamboo).
  - Examine the discord between human and nature post-Industrial Revolution.



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- Already incorporate feminism and indigenous studies; should use this as a model/precedent for incorporating eco-critical approaches to texts.
- Intertextuality, both within the course and between departments.
- Integrate the basic principles of eco-criticism to all classes, beginning in first year.
- Not necessarily just a ground-up revolution; also needs to be incorporated as a key role of government with limitations and restrictions from above.

2.

- Humanities generally and English in particular focus on communication skills and flexible thinking. Environmental literature and eco-critical readings should be encouraged to generate new approaches.
- Review the impractical ideas of a utopian society.
- Close-reading society and its approach to the environment as a text.
- Bringing eco-critical scholars into law school and ultimately government .
- Methodizing toward environmental issues.
- Using art as a method for social change; for example, books such as *Uncle Tom's Cabin*, *Of Mice and Men*, and *To Kill a Mockingbird* have inspired social change. Using these works and writing new ones to reimagine society

3.

- As above, communications skills—both oral and written—are strengths. Students thought another key role would be in education campaigns and creating bridges with the hard and social sciences.
- Other disciplines to consult with: marketing, politics, geography, all hard sciences; psychology; sociology; health sciences, law (especially environmental law).
- Students suggested the creation of interdisciplinary courses on climate change and the environment.
- Support local authors.
- Use writing/self expression/rhetorical skills to argue about environmental issues, and convince people to lower their carbon footprints.
- Examine which social classes are making the largest carbon footprints.
- Examine the past and use it to help us make improvements.
- Look into other disciplines and use them to generate discussion about what we can do to help, and discuss causes for environmental problems.
- Effective communication between the departments and faculties.
- Connecting with and understanding society at large and as individuals.
- In particular, collaborating with business, political science, environmental studies, engineering, biology, law, geography, etc.

## Geography

1.

- We are acquiring skills/tools for learning what is important to people.
- We need an environmental psychology focus to address climate change; qualitative research can help build understanding of what motivates climate change action.
- Qualitative research can build knowledge of motivations and needs.
- Qualitative research can be used to discover local impacts of, and experiences with climate change; what people know about their own impacts; what they think they can do about it.
- Can also use qualitative research to find out how "solutions" are actually working.



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- In this class we are developing communication skills and learning about different ways of disseminating knowledge.
- Countries/ Regions of world that are highest emitters of Greenhouse Gases - North America # 1, although China is catching up. Rich regions of world causing Global Warming through excessive use of energy. Poor regions will likely suffer most of the consequences due to their more southern locations, and lack of resources to allow for adaptation.
- Potential changes to ecosystems, may have consequences to local industry, which will affect the local economy and population. If industry is global in nature, this will have national and global economic consequences. For example; increased warming causing increased spread of pine beetle in northern BC, killing forests, threatening the forest industry, leading to layoffs, displacement of workers, and short term abundance of wood on the global market, with may eventually lead to a world shortage.
- Scale – key concept in (political geography) and a key concern in addressing climate change – what scale is most important to intervene? how does local impact national / global and vice versa
- “Geographical imaginaries” a key concept in political geography (i.e. we all see the world through particular lenses) ... “global warming” not a “fixed” term but a contested one, one approached through numerous perspectives – given uneven power geometries - some imaginaries become more “persuasive” / hegemonic and have performative power – “climate change means this... thus this is how we are to respond (or not respond) to it” - i.e. how are alternative imaginaries to be voiced? how are dominant discourses to be effectively challenged?
- “Territorial trap” – according to [John] Agnew [Geopolitics - Reimagining World Politics], Westphalian model of power pooled in States no longer an accurate description of political reality – political geography explores eroding state boundaries and issues that cross them – looks at other important actors – e.g. new global climate governance model emerging whereby cities are taking a leading role in the absence of effective national frameworks - transnational environmental organizations.
- Need for cooperation amongst States as the problem is global.
- Electoral geography – how was climate change mobilized as an electoral issue?
- Case study of the UBC farm crisis – shows the politics of land use decision making – land use which is intimately political and geographical is an important part of the solution / problem of climate change.
- If we further understand the spatial politics and geopolitics that arise from the issue of climate change, we will further be able to forge solutions and constructive ideas to tackle the specific issue at hand. If you understand the city by studying political geography, you can understand how land is used [and politics involved]. Example: high-rises versus urban sprawl. The UBC farm!•
- Politics of UPASS – increased ridership but Translink has not provided adequate service – thus important to take a big picture approach.
- Need government action to deal with climate change ... cannot avoid politics.
- Not an environmental issue, but a political (geographic) issue.
- Climate change is about power struggles (key focus of political geography).
- Pine beetle.
- Migration of plants and animals need to move faster than they can cope with.
- Learn how to manage changing resources.

2.

- Spatially analyzing steps that are being taken to tackle climate change; drawing connections to other regions.
- Geography is good at communicating information in different ways - e.g., community mapping; carbon footprints; combining visual information with statistical data



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- Incorporating qualitative and quantitative data, and bringing this information to people in meaningful ways.
  - Geography tends to be synthetic in its approach to knowledge-building; uses diverse approaches.
  - Physical and human geography can be brought together to help people develop solutions; it is one of the best disciplines at doing this.
  - Educating young people, who are the ones that will come up with many of the solutions we need.
  - Concern: we (in this classroom) are all coming up with the same ideas; thinking in the same ways; it is important that we think outside the box; need to come up with strategies that fit each community.
- 
- If we can better understand the regions of the world that are most affected by global warming then we will be able to make the best informed choices in our community possible to decrease the detrimental effects of global warming.
  - We need to identify the problems that are happening in our region/community and look to other regions of the world that are dealing with the problems and minimizing the harm being done: American use of cars and energy vs. European use.
  - Political geography as holistic, inter-disciplinary approach – climate change not just scientific issue but cultural, economic, political one – comprehensive approach is crucial to approaching this multifaceted challenge – political geog provides “big picture” perspective.
  - Understanding that others have alternative geographic imaginaries (ways of seeing the world / climate change) helpful in negotiations.
  - Within political geography is a long tradition of writing for the policy making audience (e.g. Halford Mackinder, Samuel Huntington etc.) – could political geographers give helpful policy advise re: global warming?
  - Mapping – e.g. green maps, mapping concentrations of problems.
  - Propose green platforms, policies, mandates ... political geography not naive about influence of and various insidious forms of power.
  - Educating public.
  - New technologies (for resource extraction) and how to retrofit your house.
  - How to organize cities, urban planning.
  - Need to create models of climate change, and how it will impact people - practical info.
  - Political geography to work with stakeholders at all levels.
  - Big business - promote energy savings tactics to reduce climate change.
  - Convince Americans that climate change is happening (strong applause) - what the states does has a big impact, partially because species migrate north with climate change .
  - Small changes make a difference and we need to create a sense of awareness and ownership in BC about what the impacts are on local species.
  - Need to get people to volunteer to go out and see what is happening in the woods.
  - Start community gardens in high schools.
  - Bring all disciplines into projects such as community mapping.
  - Elementary nature programs are successful and kids motivate parents to care about nature.
- 3.
- What is needed are bottom-up approaches that are initiated from the top! (e.g., chicago mayor built a green roof - set an example). People will look to universities - our campus needs to set the bar.
  - Geography is open to working with different disciplines, bringing together diverse skill sets, and involving the community.



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- Technological assets - GIS: can be used to create maps that will show people what the issues are, and what the solutions could look like.
- Getting information *from* people, and then disseminating it *out* to the community.
- We can bring our critical thinking skills to the table, our understanding of what bias is and how it can influence things.
- Creating a campaign that responds to people's needs, not their fears.
- Knowledge mobilization: educating young people - e.g., community green mapping in schools (recall the blue box generation of the 1980s).
- Energy saving tips, with mascot.
- Show that reducing your carbon output saves you money.
- Impose a fine on carbon emitters.
- Should co-operate with scientists: atmospheric, biologists, geologists etc. Everyone should have a scientific understanding of global warming.
- Bring global warming awareness into the elementary school system. Anti-idling laws and or campaign.
- Skills: bring holistic, comprehensive, big picture approach.
- Other important disciplines to connect with: Earth and Atmospheric Sciences, Physics.
- How should climate change be framed to have persuasive power?
- Map making, posters, etc.
- Disciplines to collaborate with: marketing, particularly community based social marketing; engineering, help with big technologies for big business; sociologists, check out how binners are reducing garbage.

### History

1.
  - Study of history helps us understand how we got to where we are and where we need to make changes.
  - History shows us that economics (profit motive) always comes before environmental protection.
  - History shows us that we continue to make the same mistakes as in the past in terms of polluting our environment, and that we have to work together if we are going to find solutions.
  - History shows the need for vigilance; legislation to protect the environment is all too often ignored.
2.
  - Learn from our mistakes; develop better technology.
  - Use examples from the past to hold governments accountable; make them live up to campaign promises rather than being swayed by industry lobbyists.
  - Formulate more effective initiatives after examining past examples of government management – or mismanagement.
3.
  - Research and analytical skills that will help us adjust to new demands.
  - Advertising campaign demonstrating the abundance of natural resources which have been depleted over time.
  - Use photographs from the past to show the impact climate change has already had. Before and after pictures help people see the reality of climate change.
  - Research the past to see what kind of campaign tactics have worked to mobilize people to action.

- Use traditional popular demonstration techniques such as the charivaris to pressure governments to act.

## Modern Languages

2.

- Teach Italians about climate change (now that we can speak it) bring universal awareness.
- Do a presentation to an Italian community centre.
- In Italy most people eat organically and buy locally.

3.

- How Italian might help us to build relationships with people in Italy and share knowledge with what they do, and compare technology. Opening lines of communication. Italian could be used to create bilingual advertisements, make knowledge accessible.
- Share our knowledge, communication, foreign affairs.
- Use creative skills to inform.
- Global impact of art and international relations.
- Collaborate with science departments to make change.

## Political Science

1.

- Climate change will cause problems on a global and local scale – relationship between global and local has to be reinforced.
- Changing weather patterns, storms etc. will make food production more difficult.
- Exports will decrease as demand for hydrocarbons and food etc from afar dries up.
- Poor countries find it more difficult to deal with the outcome of storms etc.
- Desert areas will be affected by decrease in water.

2.

- Recycling programs – early education. Clearer instructions with what can go into blue boxes (e.g. aluminum foil actually has own box at recycling depot, but unknown to many people!)
- Canadian government & other governments need to implement major reforms into legislation to make people realize that it is an issue
- Citizens follow government – if government not taking it seriously, cannot be enforced in society
- Subsidize green products (e.g. organic foods, green clothing – bamboo cloth very expensive)
- Avoid short term profit of eco-fad = need to help environment in long term, not short term financial gain
- Avoid importing food farmed in other countries (competition – seen with Chinese eggs in EU vs. standardized Canadian eggs in Canada)
- Subsidize any green action (e.g. if you go plant trees, you get incentive)

## Psychology

1.

- Forensic psychology studies relationship between psychology and law. Policies regarding climate change are governed by laws. We study why laws are made, why people don't follow laws.
- Psychology studies human behaviour. Climate change is a direct result of human behaviour. Therefore by studying human behaviour, we are studying what actually causes climate change.
- Psychology plays a significant role in public education and behavioural change.

2.

- Not just about identifying the problem behaviours, but understanding what will actually effect change.
- Psychology could help project what will happen when policies regarding carbon footprint are implemented in individual communities.
- Psychology could also inform research on why we haven't really done anything about climate change on an individual level. Everyone knows that climate change is a problem, but nobody is really changing their behaviour – try to understand what the roadblocks are
- Psychology could help us study attitude change. E.g., bystander effect: psychological principal about responsibility which finds that the more people that know, the less likely they will do something about it.
- Also study the attitudes themselves. Why have 'pro' attitudes not been translated into behaviour?
- Research what people's opinions are about climate change on individual levels.
- Psychology can help us understand the role of "climate change", "carbon footprint", and other catchphrases have as an impact in our everyday lives.
- Industrial-Organizational psychology theories can help us understand the business perspective. Also inform understanding change management.
- Psychology can construct really good research designs & have a lot to offer in terms of research skills. Test solutions – what actually works in changing people's behaviour?
- Examine whether policies need enforcement to be effective. Contribute our understanding of deterrence/rewards.

3.

- Psychologists know how human behaviour works.
- We can use the domino effect to ensure that behaviour of one person influences that of another.
- Use what we know about persuasion and behaviour change models to create marketing campaign to convince people lowering carbon footprint makes life better than usual.
- Positive reinforcement (reward) works better than negative reinforcement (punishment). Come up with positive rewards that would actually motivate people to reduce carbon footprint
- Collaborate with economics and business to understand how to make it a financially responsible choice to engage in low carbon footprint activities. Rewards that government has given so far (ex. carbon refund) have not been effective in changing human behaviour to reduce carbon footprint.
- Collaborate with political science, as they have the knowledge of how to get public campaigns in the public eye & how to make them effective (e.g., Should littering or not recycling be a criminal offence?).
- Collaborate with political science to study government and how they make decisions before you can convince individuals to go along w/ decisions.
- Collaborate with international relations, to determine how to get other countries to sign and uphold environmental agreements.

## Social Work

1.
  - Environments are a social issue.
2.
  - Doing different things to reach social change.
  - Educating society.
  - Individual change and promotion within agencies.
  - Making connections between individuals and societal awareness/change.
  - Education to our clients.
  - Change agency habits.
  - Community awareness.
  - Go to community meetings/forums and raise awareness.
  - Personal modeling.
  - Join with local artists to promote awareness of climate change issues.
  - Community planning to build more compact neighborhoods and public transit.
  - Provide life skills re: recycling, energy uses, low energy lifestyles.
  - Advocate for new sustainable social housing.
  - Advocate for affordable green options.
  - Educate marginalized people about options.
  - Develop more community gardens and food sharing programs.
  - Become politically-active.
3.
  - Skills include: collaborating with businesses, interviewing skills, community organizing, planning, and purposeful work.
  - Work with businesses, organizations and other disciplines.
  - Work with teachers, designers.
  - Develop facilitation skills (groups).
  - Networking with agencies and community groups.
  - Advocating within agencies for resources.
  - Negotiating skills in working in agencies.
  - Collaborating with political science and business.
  - Stimulating discussion with political figures.
  - Increasing public transit system.
  - Working with environmentalists.
  - Communication and group skills.
  - Identifying clear connection between environmental health and social health

## BUSINESS

### Business, Management & Marketing

1.

- Our class covers government policies, their trade-offs, pitfalls and limitations. In this regard, we subsequently learn about the incentives for firms to reduce pollution.
- Tying together economically feasible solutions with government action.
- Considering incentive effects, making policies people want to participate in.
- Price it through the market; we are learning about how these situations work themselves out naturally through market movements.
- We are learning about government business, how the government can use its policies and use tax revenues to invest in alternative energies (wind power, etc).
- How environmental groups affect government policies. The importance of lobbying by groups to change policies into climate friendly ones.
- Becoming entrepreneurs in the future, we are well aware of the global crisis and this will lead us to make better choices for the environment in regard to how we run our businesses.
- To have our businesses use more electronic forms of communication (e.g. e-mail).
- Add more in-depth environmentally-friendly plans to our business plans.
- Enables us to analyze the efficiency of certain policies that can potentially solve environmental issues.
- We are learning about the government's involvement in business we are learning how we can apply them ourselves, top down approach.
- Negative externalities produced, we try to frame the problem in a model context, and we try to model what's going on in the real world and make simple assumptions and try to understand it. We try to think about the externalities generated and the cost for society.
- We learn about cost-benefit analysis, how benefits also have costs to society. Policy making point of view we can see what the cost and benefit is of each policy and decision.
- The approach of the government to change individual incentives. How changing incentives from the top down we can change social norms (arrow) and it can have an impact in climate change.
- Frame the problem in terms of a model, make assumptions and find solutions to it.
- Changing our social norms, change how we perceive the problem.
- A real-life example of seeing how things should be and how they actually are.
- We are more informed voters when policy issues come up because we know what policies consist of-- understand different policy options and take what we learned from the course to comprehend present problems and issues and can brainstorm/come up with an idea of the ideal solutions to them.
- Learn how to factor in externalities to problems (mostly negative) and apply them to climate change concepts.
- Ability to explain something—put it into context of what we're learning in class and what is currently happening in the world.
- Renewable resources—seeing what costs come up and that there are benefits to them---don't go too extreme where we want to eliminate all form of consumption, but use it in a way so that we see and derive benefits.

2.

- Leverage brainstorming technique: working as a team, we can brainstorm ideas on how to go about leaving a carbon footprint.



## go BEYOND

- Use focus groups to gather ideas, creating synergies within the community.
- Use effective communications over a span of cultural and geographic barriers.
- Develop new business practices and cost-effective solutions.
- Business ethics: pass more environmental laws.
- Educate on climate change.
- We are the business people of the future; our awareness of the issues will affect our decisions and business strategies in the future.
- Some may even choose to develop businesses that have strategies specifically to address the climate change issues in our community.
- Corporate social responsibility.
- Green firms, starting businesses with green objectives.
- Can let businesses choose which environmental solutions are more efficient and promote them.
- Many firms raise their community profiles through environmental activities in the community as well as by reducing environmental emissions at work.
- Businesses can develop new products (innovation) that have less impact on the environment.
- Firms can use manufacturing processes that use less energy.
- Develop businesses that meet demand for energy efficiency.
- This will also result in more funding for R&D in this area as more products develop, competition increases, cost for consumers will decrease.
- Develop alternative products to those that are harmful to the environment
- Sources of businesses that better the environment in some form are sometimes derived from "environmental trends" that are changing in the marketplace.
- We will think about the environment and develop more environmentally friendly products (\$ will be put into R&D, eventually creating more competitors in the industry, therefore causing the cost of these products to go down).
- All the classes in general can create awareness about sustainability and the environment. Through university education some of the change can be implemented.
- Real estate: the LEED program or green buildings. The issue is that there is not being education and then implementation. Developers get points for being green but tenants should be educated to implement the eco measures. If I work for a firm that is developing, I can get to modify the system to add education to the program. A Sauder professor was involved in this LEED program.
- Finance and accounting play a big role in efficient resource allocation and capital allocation. Ex. implementing a UBC-wide recycling program we would budget to get to the target. Juggling money.
- Marketing: creating awareness in general and let people know about it, create interest in people that people can find the necessary information and take action. Awareness and why should we care about it to help implement any strategies.
- Connecting a brand with a social cause, make consumers aware about the brand that is green. Tide and their clean program that helps victims of hurricane Katrina, if there was a climate change campaign telling consumers.
- We are always thinking in this class what the govt can do. Someone brought up the point about how to affect the consumer decisions and choices to be greener.
- HR: employment brand. When we recruit employees to the company, find employees that support their cause and have the same values the company does. So target to recruit employees that are environmental friendly for example. Fill in the gap of information asymmetry.



## go BEYOND

- In HR you are able to create a corporate culture and you have it you can have everyone in the company act upon environment friendly activities.
- By evaluating policies government puts out and understanding principles like the Cost-Benefit principle and apply them to getting the word out there
- Real Estate- promote houses that are greener, use solar energy, use urban land econ to argue that any building that isn't a building has negative externalities on the area and can lower property value.
- Marketing- perform public service announcements to make people aware of the problems at hand, promote environmentally friendly practices within firms, have campaigns.
- Economy- studying environmental effects—aware that there is a trade-off between environmental efficiency and fairness.
- Finance- lots of high cost technologies at the moment so must allocate resources where it can pay off more, companies are looking for next viable technology or new idea.
- Human Resources- create internal policies for corporate social responsibility, such as carpooling and other things that are good for the environment.

3.

- Useful business skills: marketing, organization, accounting, research skills, HR, communication.
- Marketing, particularly the social type (marketing ideas) will be useful in spreading awareness, education and inspiration to others.
- Finance will calculate if the projects are economically feasible with cost-benefit analyses. This discipline will also be useful in realizing ways to finance the projects.
- Networking is very important in creating awareness of a public campaign, as well as for rallying support for the campaign.
- Collaborate with sciences because they know the technological problem, they will allow us to create reasonable solutions.
- Collaborate with marketing: you must motivate people to reduce carbon footprint (give them information of why, how, etc.)
- Work with those who have finance skills to create a reasonable and clear budget (minimize costs).
- Marketing strategies to deliver messages so that people understand; promote environmental groups using marketing skills.
- Analyze cost-benefit of different environment-friendly manufacturing strategies to pick most efficient (using NPV analysis).
- Work with engineering and environmental science studies.
- Use education as a tool for discipline.
- Infomercials –advertisement.
- Statistics-compare the past, now, future.
- Car pooling, company, employees.
- Public speaking.
- Public relations.
- Marketing.
- Technology and information.
- Planning skills.
- Trying to be environmentally friendly in all/most aspects of our daily lives.
- Encourage others to do the same.



## go BEYOND

- Collaborate with sports and entertainment – a lot of people are into sports and entertainment as they go to games and events. If we promote our campaign at the events and in rinks/stadiums we can reach a lot of people
- Collaborations with TV/Internet – large audience.
- Align medical/safety with environment safety – if one's own health and safety is in jeopardy, then he/she will pay more attention and react to the causes.
- Collaborate with politicians and Government – huge media attention, creating a huge audience to get our message/campaign out there.
- Skills: Leadership skills, Communication and networking.
- Collaborate with environmentalists, forestry, people with science backgrounds. It increases your credibility and people will take it more seriously.
- Collaborate with psychology to be able to influence people.
- Collaborate with urban planning. Ex: it has to do with urban density and how it can plan to be more eco friendly.
- Relationships developed through Sauder can affect firms to encourage them to go "green".
- Skills: Ability to stand out as leaders; Presentation skills—can communicate ideas and results to a wider audience; Open-minded—have basic knowledge of all different aspects (HR, Marketing, Finance, etc) and bring everything together, provide a good link for all those disciplines.
- Collaborate with: Engineering- technology will be biggest influence for green efforts; People in government—those that can enforce policies that we are trying to establish; Environmental Sciences; Politics- providing long-term policies as opposed to short-term ones; Education Faculty- teach students who are in elementary, secondary school to better incorporate it into everyday lives of people from a long age, exposure over a longer period of time; Psychologists- understand humans, how different cultures work together, and cater your plan of action towards the different aspects.

## ENGINEERING

### Engineering

1.
  - We design systems that produce and use power.
  - We can look to green energy such as fuel cells, PV systems, tidal and wind turbines to power our systems.
  - We are in the position to pressure companies to design devices that use reduced power consumption rates.
  - We can implement systems that go into auto-standby when not being used.
  - Analyze the cost and benefit of different solutions to see what would give the best results for the inputted effort.
  - Implement economic analysis on specific technologies.
  - Crunch technical and economic numbers to assess incremental improvements.
  - Assist in the implementation of policies to decrease cost for sustainable alternatives.
2.
  - Professors to perform research into design systems to improve older polluting technologies locally and internationally that can be easily implemented.
  - Create more classes that teach about design and usage of alternative energy systems.



## go BEYOND

- Offer program options focused in specifically in alternative energy systems (e.g. Electrical Engineering option: Solar power systems or Electrical Engineering option: Eco-friendly power generation.
- Produce coop positions to work with companies doing eco-friendly research projects in the region (even if they pay a minimal amount, e.g. a scholarship amount of around \$3000.00 for a 4 month term) just to gain experience working with this technology.
- Develop carbon neutral technologies \$ to R&D.
- Develop cost effective development of green technologies.
- Popularize green technologies.
- Be aware of what we are developing.
- Make transportation less necessary.
- Improving energy transmission efficiency.
- Improve efficiency of industrial machinery.
- Make oil sands extraction more efficient.
- Environmental certification of buildings.
- Work in renewable energy positions.
- Apply knowledge to increase transportation efficiencies.
- Develop technologies for international market.
- Design regulations to enhance environment.

3.

- Work with students from English, Law, Political Science and History departments to assist with engineers in presenting persuasive proposals on eco-friendly designs.
- Pressure companies to design devices that reduce power consumption.
- Government involvement – push to reduce technology transfer cost to allow vehicle manufacturers to produce hybrids cheaper than straight fossil fuel driven.
- Tax old technologies being sold and give tax deductions to newer energy efficient systems sold.
- Pressure government to pressure countries not trying to decrease their carbon footprints (assist them with technology transfer and provide incentives to get them to move to more efficient and cleaner systems).
- Promote driving at optimum speed.
- Collaborate with law and political science.
- Inform the public.
- Get in contact with city planners.
- Design and promotion of environmental technology.
- Collaborate with Architecture and Sociology.

## SCIENCES

### Biology

1.

- This course focuses on vertebrate adaptations and evolution, so the clearest link is that climate change is occurring so rapidly that natural selection won't be able to work rapidly enough for terrestrial vertebrates to adapt.



- Because so many of the features of terrestrial vertebrates (this class specifically dealt with birds) have been adapted to deal with the challenges of the species' physical environment, climate change will bring about conditions that species will not be able to survive. For example, migrating birds may come back earlier than normal and fall out of synchrony with their food resources.
- One ecological consequence of climate change may be an increase in the capacity for invasive exotics to get footholds and overtake native species. Effects of exotics will spiral through the community.
- While acknowledging that we as individuals have impact on climate change, we did not perceive that our discipline directly contributes in a major way to the acceleration of climate change.
- Biomembrane labs do generate a lot of plastic waste. The cleaning and re-sterilization of test-tubes likely would produce more GHGs than disposing them, and is not cost-effective. Cost is a major factor in research labs, as government grants are almost never sufficient to cover that actual cost of doing the research.
- Climate change and its effects (an accumulation of green house gases, the depletion of the ozone layer, etc.) may be linked to a variety of diseases such as skin cancer.
- An increase in global temperature is one of the underlying causes for the spread of tropical diseases such as the West Nile Virus.
- Drastic climate change has selected for and against a variety of organisms, most of which we are directly dependent upon (ex. Crops, animals, trees, etc.) This could in turn lead to a shortage of food, building materials, etc.
- The melting of ice caps will cause massive flooding worldwide. For densely populated countries such as India, the results of such flooding would be devastating.
- Climate change is related to disruptive and unpredictable weather patterns. There has been a steady increase in the severity and frequency of hurricanes, tornadoes, and a variety of other extreme weather phenomena.
- A reduction in our carbon footprints could lead to healthier lifestyles. By walking to class (rather than driving), a person will receive more exercise. Eating locally grown foods (versus the hormone-ridden, genetically modified foods from abroad) could also help a person lead a healthier life.
- Biotechnology/biomimetics can be used to overcome some of the problems associated with global warming.
- Photosynthetic organisms could be used to develop photosynthetic hybrid photovoltaic cells.
- Bioremediation could be used to remove hazardous by-products of industrial processes.
- Engineering thermo-tolerant organisms as well as salt tolerant organisms (i.e. organisms that are better able to cope with environmental extremes) may alleviate ecological instability. Engineering organisms that are able to more efficiently capture carbon such as CO<sub>2</sub> from the atmosphere may also negate the effects of global warming. Engineering organisms that are capable of more efficiently converting N<sub>2</sub>O to either NO<sub>3</sub> or N<sub>2</sub> could also lower the effects of greenhouse gases within the atmosphere.
- Carbon fixation is a basic cell biological concept that we teach in our class - genetic modification of organisms (plants especially) can be used to help make plants fix more carbon, make them more robust to environmental changes.
- Plants and humans interact, actions affect plants which affect environment connection between plants people and environment.
- Distinct relationship between plants and people, dependant on each other.
- Plants large sink and source of CO<sub>2</sub>.
- Ecosystems, ecology. We have a good understanding and better awareness of what greenhouse gasses are and their effect on the environment. We know about nutrient cycles and their effect on our ecosystem and growth patterns in our area.

2.

- The knowledge we have about how the natural world works will allow us to better predict the kinds of consequences climate change will have for native wildlife and perhaps how to lessen impacts.
- Because the species we study are charismatic, they can provide valuable examples to educate (scare) the public about the consequences of inaction.
- Biochemists can provide scientific input into the efficacy of various fuel alternatives for cars (oil and gas substitutes) that might burn more cleanly and generate lower CO<sub>2</sub> emissions.
- Molecular biologists can provide expertise in genetic engineering of bacteria to degrade toxins - from oil spills to toxins in the Alberta tar sand ponds, to plastic bags. Research like this is currently being carried out at SFU and UBC.
- Molecular biologists and biochemists (MBB) can provide expertise in isolating, characterizing, and fermenting bacteria that release hydrogen (as a byproduct of various metabolic pathways) – a source for hydrogen fuel.
- Composting is great for waste recycling, but still generates methane during decomposition. MBB scientists can also provide expertise on the harvesting of this methane, reducing the amount released into the atmosphere.
- MBB scientists, like all scientists trained in critical thinking, can contribute logic to discussions on policy.
- Biotechnology could be used to solve many of the problems related to global warming (for example, some trees have been genetically modified to uptake a larger concentration of carbon dioxide).
- Some aspects of biotechnology are now turning to nature itself when trying to combat global warming. By mimicking natural processes that occur within our environment, scientists may be able to treat the problems associated with global climate change. It is important to note, however, that although science can be used to combat global warming, it can also contribute to this problem (for example, biotechnology that increases crop yield can also lead to a decrease in genetic diversity).
- Due to the lack of funding, most of the environmentally-friendly biotechnology will remain outside of the public sphere. If this technology does somehow make into the public sphere, it will most likely remain limited to those individuals who are capable of affording such high-priced technology. Further, people often tend to resist technological advances that are linked to the environment—people tend to stubbornly adhere to inefficient, gas-guzzling technology. This problem needs to be addressed.
- If schools were to emphasize the importance of environmentally-friendly activities and behaviours, then perhaps individuals would be more willing to join the fight against global warming.
- Climate change in Kamloops may result in an increase in grassland and desert areas. In order to live off of this dry landscape, we would need to better regulate and monitor the distribution of water, as well as the distribution of organisms (especially those that we are dependent upon for industrial processes).
- Molecular geneticists could potentially engineer organisms that are better adapted to this environment: Genetic modifications to certain organisms could allow for protection against desiccation, high salinity levels, and pathogens.
- Geneticists could also engineer crops to maximize growth, production, and N<sub>2</sub> fixation rates. However, we must be careful when engineering organisms because it is difficult to predict how these genetically modified organisms will respond to their environments and associated organisms.
- Empower students to understand that knowledge is power.
- Teach the basic biological concepts of carbon fixation.
- Make more specific linkages between Biology and climate change.



## go BEYOND

- Use applied biology examples to increase awareness of the "uses" of cell biology in topics such as climate change.
- Show people how we can develop solutions (lead by example) - we will be models for change.
- Have the advantage to network with people who have the ability to make these changes (larger organizations, connections with the public).
- University is a huge connection between individuals interested in making a difference.
- Make going green fashionable (drive hybrids not huge SUVs).
- Modify crops to uptake carbon dioxide from the atmosphere - affect the environment in a favourable way.
- Work as a university to develop different agricultural techniques to use the land more wisely.
- Science is most relevant to this topic, chemistry of how climate change occurs and how that affects our environment on a biological level.. We participate in the massed public transport system, have u-passes.. Recycle and compost more than areas outside campus.
- Our focus on ecology helps us to better understand the smaller localized effects of climate change, as well as the large scale, world-wide effects.
- Use our knowledge to develop carbon eliminating technologies.
- Create by-laws to enforce "green" habits.

3.

- We are fortunate to be in the top % of the people in the world who have the knowledge to appreciate the scale of the climate change problem. We have not only clear examples of what might occur, but we have developed the communication skills to tell the general public about why action to reduce our collective impact is important.
- As people with knowledge of how to begin reversing the causes of climate change, we can begin to initiate hands-on projects, like habitat restoration, to help change the direction of climate change.
- Although we have knowledge, we often don't understand the politics of getting people and governments at all levels to act. Perhaps if we were working alongside political science students, or philosophers we could build on each other's strengths.
- If environmentally-friendly behaviour could be shown to clearly increase the well-being or health of individuals, then perhaps people would care more about this topic.
- Unfortunately, money is another motivational factor that could cause people to become interested in (indirectly) combating global warming (for example, making organic foods cheaper than imported foods would cause people to buy healthier (and cheaper) organic materials).
- All disciplines need to be involved with this topic. Everyone needs to focus their efforts towards this problem if we are to overcome it.
- We should incorporate programs that educate individuals about environmental change and how transgenic research and technology can be beneficial both locally and globally.
- We may need to collaborate with physicists when translating the energy in biological systems to energy that will be available to the public. (e.g. Using photosynthetic hybrid photovoltaic cells instead of traditional silicon based solar panels).
- Mandatory for people to know about these issues e.g. Learn about it in school -mandatory classes.
- Propose new business plans that encourage community gardens.
- Promote local crops both recreational and nutritional - outdoor grown, not by lights (waste of energy), minimize energy inputs into crops.
- Solar or wind power - promote alternative energy (subsidies for the expenses).
- Promote consumer use of alternative sources of energy.



## go BEYOND

- Show people how they can personally benefit (saving money).
- Promote cooperation between students and community (i.e. Labor markets and expertise).
- Promote well-used spaces, such as green spaces used for productive purposes like vegetable gardens.
- We can educate people about climate change and what causes it, we could collaborate with engineering to create better plans that we can realistically employ.
- We can educate others within the school by acting together, all professors and students and not just an isolated group.
- Hold fundraisers to help fund more research for green alternatives.
- Make it a curriculum requirement that students have to take a class on environmental change, and awareness.
- More encouragement (tax breaks?) For people using public transport, bicycles, carpooling etc.
- Encourage more recycling and composting, more receptacles for things like old computers, batteries, and other "techno-junk"
- More blogs, public forums about going green, celebrity encouragement to go green
- Engineers, politics (voting influence), commerce (marketing aspects), chemistry (education about factual changes, explaining impacts), arts (campaign, promotion)

## Chemistry

1.

- Sources, sinks and reservoirs of organic and inorganic carbon.
- Fate and distribution of CO<sub>2</sub> and CH<sub>4</sub> (and other GHGs) in oceanic reservoirs.
- Chemical speciation is affected by environmental conditions (pe and pH).
- pH of the environment affects the protonation ability of chemical species
- pe affects the redox state of chemical species (eg. methane under anoxic benthic conditions of the ocean floor and N<sub>2</sub>O under intermediate pe conditions in pore water)
- Residence time of chemical species influence their ability to manifest change and the 'lag time' between cause and affect
- Aqueous solubility of gases (Henry's Law constant) decreases with increased temperature, influences 'lag time' and contributes a positive feedback mechanism
- CO<sub>2</sub> and CaCO<sub>3</sub> solubility are strongly influenced by pH
- Marine acidification resulting from increased atmospheric CO<sub>2</sub>
- Hydrological cycle is influenced by climate change, which will affect the overall distribution of water resources (increased potential for flood and drought events). Less water in temperate lakes/streams will influence the physical, chemical and biological characteristics.
- Knowledge and deeper understanding of the chemical reactions (physical and chemical properties and behaviour) involved in climate change.
- Able to produce quantitative data/ use techniques in order to teach others and provide evidence about climate change specifics.
- Compare the global situation to chemical equilibrium to better understand the effects of change.
- Carbon is an element which is the main component of organic compounds, including carbon dioxide.
- One can predict reactions within the biosphere.
- Reactions that produce and counteract climate change can be determined.
- Pharmaceuticals produce lots of pollutants.
- Chemistry can be used to harness clean energy instead of burning fossil fuels.
- Can use chemistry to measure the levels of CFCs and CO<sub>2</sub> in the atmosphere.

2.

- Students in the discipline of Chemistry develop a solid understanding of the physical basis of the 'greenhouse effect' and sharing this information with others is part of promoting a greater understanding and appreciation of the issue.
- Simple chemical principles can be employed to convert various energy efficiency measures into an equivalent number of tonnes of CO<sub>2</sub> saved or equivalent number of vehicles taken off the road annually. These measures can be used to influence energy consumption behaviours.
- There is enormous potential for chemical innovations which increase energy efficiencies, provide alternative energy sources and improve carbon sequestration strategies. This includes a range of new materials being used in fuel cell membranes, artificial photosynthesis, hydrogen production/storage, superconducting materials, photovoltaics and new catalysts for the solar production of hydrogen from water and production of methanol from carbon dioxide.
- Develop solutions based on our understanding.
- Understanding the chemical properties of pollution in order to reduce it.
- Develop alternatives using knowledge of similar chemical properties.
- Innovations (energy storage, energy generation, photovoltaic cells).
- Generate energy via solar power /wind power.
- More efficient reactions and solutions through new chemical reactions.
- Eliminate harmful chemicals.
- New materials (lighter, stronger, "sweet alloys").
- Streamline manufacturing processes.
- Forecast future situations.
- Carbon sinks and traps in industries (plastics, scrubbers).
- Educate about bad science (solar cells in cars, hybrid cars, etc.)
- Promote nuclear energy.
- Chemistry can be used to measure pesticide problems (grow food with no pesticides!)
- Can educate people on how to make biodiesel.
- Make environmentally-safe cleaning products with simple products such as baking soda, lemon juice, etc.
- Using microbiology to break down dangerous pollutants/chemicals.
- Can analyze organic compounds and discover new mechanisms to get rid of carbon dioxide in the atmosphere.
- We can study organic compounds and find better ways to produce energy that doesn't result in the production of greenhouse gases.

3.

- Understanding is the key to motivating people to changes in their own lives and Education is the key to understanding. People do not act on things they do not understand. We need to make sure that people understand that science is an iterative process and is inherently sceptical. So if climate scientists appear to disagree on specific predictions, this ought not be used to undermine the entire theory of global warming.
- Aqueous Chemistry students are already involved in a public education program on the science of climate change (but the entire population needs to develop a deeper understanding of the causes and implications of climate change). There are skeptics that do not believe that climate change is happening and there remains a great deal of mis-information on the topic. A public education

campaign would introduce the public to following important points; 1.) that the greenhouse effect is a real and observable phenomena known, 2.) that GHG concentrations have been increasing since the 1800s and most dramatically over the past 50 years, 3.) that the increase in GHG concentrations is linked to the increase in global temperatures and environmental impacts of climate change, such as sea and land ice loss and 4.) there are environmental, economic and health benefits of energy conservation and alternative energy sources (e.g., improved air quality, new technology development, job creation). The campaign should be easy to understand and targeted to a particular audience. The severity and urgency of the climate change situation needs to be expressed in order to provide an incentive for the alternative sources of energy to be developed. We are going to run out of fossil fuels at some point and need to think of the future.

- VIU chemistry students target local grade 10 students, but we should collaborate with other faculties/disciplines here at VIU. By working with biologist, business, trades and social scientists, the population will have a better appreciation of the urgency of the matter. As there is not only positive environmental implications of dealing with climate change, but there are also long term economic, social, health impacts benefits as well (e.g., reductions in fossil fuel combustion may results in lower incidence of childhood asthma). All industries/business would be targeted in a public campaign as climate change is not just a scientific curiosity, but a complex inter-disciplinary challenge.
- Public awareness should be combined with incentive programs for homeowners to buy/renovate/build green homes and businesses. Carbon dioxide intensive materials like cement should be capped and limited by city planners and green engineers. An incentive to save money, save energy is needed; the power of the dollar is a powerful motivator. Promote lower carbon footprint transportation (e.g., bicycling and public transportation) by improving safety and accessibility of these options.
- Challenge different employment groups to create more competition to lower fossil fuel consumption. Provide economic incentives for employers to encourage car pooling.
- Politicians have the power to create policies that may not stop anthropogenic GHG emissions but, the policies may lower the emissions creating cleaner atmosphere for years to come. Politicians need to be recognized for acting on climate change issues; most politicians are not willing to risk short term political losses (i.e., their job) in order to protect our environment over the longer term, especially if it takes several decades before the benefits are realized. Although, carbon taxes are not popular, they at least provide a direct incentive for people to start changing their energy consumption behaviour (car-pooling, riding a bicycle or taking public transit) and create a much needed market advantage for carbon neutral alternatives.
- Educate our peers and community.
- Use laboratories and courses to integrate more ideas of climate-change into the curriculum.
- Use all green materials for the campaign.
- Analyze other communities/organizations and their techniques and apply them to our own campaign (avoid ineffective techniques).
- Promote green cleaning supplies.
- Work with biologists, ecologists, and marketing.
- Hire people to be in charge of large-scale recycling in schools, businesses, etc.
- Start promoting green lifestyle choices with children in elementary schools.
- Have community seminars to educate older community.

## Environmental Studies

1.
  - Energy use is mostly caused by energy demand.
  - Energy resources have a huge role in climate change.
  - The basis for our studies is the societal, historical, and economic barriers to our society's acceptance of environmental issues in general, but climate change is one specific issue.
  - To think critically about some of the different information sources, whether it's TV, radio, publications, etc.
  - As Northerners, we experience first-hand the impact of climate change, long before Southerners. And, as far as we know, we're the only class participating in this that is in the North.
  - Learn about Gaia theory; regulates the climate and we are perturbing it.
  - Negative and positive feedback loops.
  
2.
  - Researching biofuels—additives to increase octane number.
  - Planners could implement through Official Community Plans—different types of energy to power the city.
  - Chemistry and biology could contribute resources—technology and advising.
  - Develop partnerships (community and university).
  
3.
  - All disciplines are important and have different things to contribute.
  - Negotiation and participation skills are key.
  - Background knowledge and information must be produced.
  - Would need: environmental engineers, chemical engineers, policy makers, planners, economists.
  - Skills include: Social cohesion; Outside the box thinking; Focus on ourselves and not spreading it, but at the same time dialogue with others; Methods of discussion and listening; Idealism (dreaming); Prospective mind; possibilities and potential from catagenesis.
  - Collaborate with all relevant disciplines, including business and trades (to develop sustainable skills).

## Forestry

1.
  - We study the effects of climate and climate change on forest plants (e.g. plant responses to stress, such as changes in seasonal temperature, and adaptation to changing ecosystem conditions; impact on biodiversity).
  - Trees depend on certain climate conditions (e.g. germination and winter dormancy may be affected by changes in climate); climate change can affect tree development.
  - Trees and forests are carbon sinks.
  - Forest organisms/ecosystems can be indicators of climate change.
  - When trees are harvested (or otherwise removed – e.g. by fire), their removal affects carbon uptake, soil properties, water run-off, etc., all of which can feedback on climate.
  - We will need to know how to give a knowledgeable defence of the “no logging” push that will be coming from the urban centres.
  - We will have to be able to manage a forest properly so that it continues to be carbon neutral.



## go BEYOND

- People in our class will be leaders and managers in forestry at a time when global warming is very severe.
- Knowledge about use and availability of resources.
- Knowledge of natural systems.
- Knowledge of gases that are related to climate change, and their function in our environment.
- Knowledge of different zones within our province (BEC zones) and how they function within, and with each other.
- Knowledge of negative impacts of industry and mass producing.
- Knowledge of how population increase can affect our resources, and how we NEED to manage our resources in order to survive.
- Knowledge of human impacts on earth.

2.

- Better reforestation.
- Management of forests as carbon sinks.
- Improvements in soil management, to maintain soil fertility and reduce desertification.
- Fire management.
- Design of carbon offset programs (e.g., through reforestation) to ensure these are truly effective and efficient.
- Promote urban forestry and the care and maintenance of urban ecosystems (e.g. parks, green roofs, city trees, local woodlands, home gardens).
- Research and education for purposes of climate mitigation (e.g. planting trees for C sequestration) and climate adaptation (pest management, species conservation).
- Promote forest recreation and ecotourism; to get people into the forest so that they have a stronger relationship with nature.
- Renewable bioenergy.
- Understanding of the ecology of forests and how to best manage them – go further than simply planting trees.
- Local teaching of how to use forestry's knowledge of sequestering carbon (planting green species).
- Keep mills open in smaller communities to cut down on the distances that need to be travelled by logging trucks.
- More localized use of wood to cut down on pollution from shipping.
- Educate others, because we have the background knowledge. Let people know why they are being told to conserve and think about climate change.
- Practice what you preach (always the first step).
- Teach the younger generation to not only change their ways, but teach them that change is ok, and we need change at the industry level.

3.

- Public education: promote appreciation of forests and their key role in the carbon cycle; initiate awareness of climate change at a younger age; provide information on choice of trees and growth requirements; get people to listen.
- Encourage tree planting.
- Encourage the use of wood as a way to store carbon (e.g. in buildings) and to replace non-renewable materials (steel, concrete) that have a much higher carbon footprint.



## go BEYOND

- Collaborate with educators, geographers, environmental scientists, foresters, urban planners (community gardens, green spaces and green ways).
- Get public awareness about the building industry and the impacts of using steel and concrete instead of wood products.
- Recycling and composting must become more mainstream.
- Encourage people to plant trees around town, and their houses.
- Actual understanding of global warming and climate change is the base to any work that can be done.
- Understanding natural systems and what they need to function and prosper.
- Use our knowledge to show people the impacts of human activity but in a fun, inspiring way, opposed to being told we are in trouble and need to change.
- Collaborate with the following disciplines: business, economics, marketing, advertising, social sciences, trades, and adventure tourism
- Everyone living on earth needs to work together, and gain knowledge of what is happening, if we could develop a sense of community that would be a start to start the flow of ideas, then every discipline would be able to better understand the bigger picture.

### Mathematics

1.
  - We can use math to figure out how much waste we create and figure out how much waste we reduce using calculations, possibly looking at it on a monthly basis.
  - Use the internet to reduce the amount of paper use, use mechanical pencils instead of disposable.
  - Also reusing pens and refilling with ink. Bookies selling pens using soy based ingredients that are biodegradable when ink runs out.
2.
  - Figure out people to waste ratio and energy use statistics.
  - Using parking passes for more than one person in order to promote car pooling.
  - Develop compost program as well as recycling.
  - More cooperation between school and the buses.
3.
  - Math used for statistics. people on board, people needed on board, where we are on emission output and reduction.
  - People skills getting people on board (bus, etc) using background information.

### Natural Resource Management

1.
  - Change in range of tree species.
  - Regeneration of forests.
  - Insect outbreaks.
  - Will trees adapt?
  - Dendroclimatology as a tool.
  - Trees take up CO<sub>2</sub> and produce O<sub>2</sub>.



## go BEYOND

- Manage reforestation for future generations.
- Carbon offset- paying into funds for carbon use.
- Trees are a renewable resource.
- Increased temp decreases fish populations.
- Increased CO<sub>2</sub> will increase photosynthesis (good effect of climate change).
- Decreased biodiversity in aquatic systems.
- Less ice in winter on lakes, bad because species aren't adapted.
- Climate change has an effect on nutrients, water supply, temperature and ph which affects fish.
- Commercial fishing industry is affected by climate change b/c fish supply will change (likely reduced).
- Opportunity for harvesting new species as water warms.
- Changes in species range may affect the tourism industry.
- As water warms, however, we will expect a reduction in biodiversity, and therefore a reduction in ecosystem resilience.
- Fishing boats add greenhouse gasses to the atmosphere.
- Water demand will increase, while the change in water allocation may reduce the water supply.
- Changes in water currents as the ice-cap melts will affect marine species.
- More frequent extreme weather events.
- Fish stocking policies may need to consider changes in the environment when selecting appropriate species.

2.

- Changing tree species and planting tree species.
- Educate.
- Using science to assess the impacts of deforestation on our climate.
- Finding alternate fuel sources.
- Cleaner forest industry codes.
- Use of dendroclimatology.
- Plant more trees to use up more CO<sub>2</sub>.
- Use drought tolerant native species.
- Develop models to predict changes so we can manage accordingly.
- Develop alternative energy means – wind, solar, run of river, tides, biofuel (though grains are controversial). Perhaps algae (can be cattle food and fuel for burning) and “agricultural fecal resources” (methane harvesting).
- Implement holistic land management that is aimed at reducing our carbon footprint.
- Make optimal use of beetle-killed wood (composite building material, decorative, furniture etc.).
- Large/Industrial fisheries that we subsidize are probably the least sustainable from a climate change perspective (i.e., CO<sub>2</sub> emissions are greater).
- Implement more sustainable practices in the resource sector (e.g., Operational forestry practices).
- We can provide education on the impact that climate change will have on Natural Resources as, well as possible solutions (to all age groups).
- Application of ecosystem function knowledge (i.e., The Carbon Cycle).
- Implement policy regarding the reduction of greenhouse gases.
- Conduct research on climate change effects (use this to develop solutions).
- Be an example to the public – be seen adopting sustainable practices.



## go BEYOND

- Create incentives for developers and homeowner to use energy efficient technology (i.e., Geothermal heating).
- Incentives and opportunities to buy local.

3.

- Combine natural resource management with economic incentives for collaboration on encouraging and facilitating reduced carbon footprints.
- Encourage grey water systems for buildings – less energy spent pumping water to houses, and less total water used.
- Human-powered lawnmowers.
- More drought-tolerant grass species and xeriscaping (to reduce water use).
- Research skills.
- Communication and Networking skills.
- Conflict Resolution skills.
- Stakeholder interaction skills.
- First Nation Consultation skills.
- GIS skills.
- Partnerships with organizations that we have connections with (i.e., Grassland Conservation Council).
- Develop a marketing scheme to promote young kids to embrace low emission lifestyles (use a mascot – like Smokey the Bear).

## Physics and Astronomy

1.

- Understanding of energy efficiency.
- Tips for improving driving habits (from understanding kinetic energy and friction).
- Research into new energy resources (including renewable resources such as solar, wind, tidal).
- Understanding of energy costs of shipping products such as foods.

2.

- Make new large buildings that have geothermal heat, like the new library at Langara College.
- Develop hydrogen-powered buses.
- Solar panels on roofs.
- Develop cheaper hybrid cars.
- Battery research to develop lighter batteries for transportation purposes (electric cars & scooters).
- Mandate use of timers and sensors to control energy consumption.
- Road improvements to make driving more efficient.
- Research into improving renewable energy sources, especially for large consumers such as industry.

3.

- Understanding your electric bill - collaborate with math & marketing.
- Research predicting climate in future.
- Education on energy conservation habits at a younger age.
- Collaborate with popular people (leaders, media personalities).
- Collaborate with businesses.

## TRADES AND APPLIED STUDIES

### Career and College Prep

3.
  - We could use our English, math, and computer skills to write letters and lobby for car pooling for businesses and industries in our area, and for businesses composting and recycling.
  - We should work with environmental, philosophy, science, and marketing students to help us with the proper direction of these projects.

### Communications and Human Services

1.
  - Accessibility awareness (wheelchairs, carpooling, public transportation).
  - Accessible door to door shuttle service for individuals requiring increased support in our community.
  - Job coaching for green jobs.
  - Green supported employment: gardening, recycling, composting, farming, transporting grains through alternative means, volunteer fruit picking.
2.
  - Task analysis.
  - Transportation, carpooling, meal preparation, clear instruction for climate change initiatives, job coaching.
  - Clear communication.
  - Objective documentation.
  - Increasing community awareness, critical thinking and shifting from judgement to curiosity.
3.
  - Create programs that enforce the use of green or reusable cups, utensils, boxes, soup containers, example coffee in a reusable cup = \$1.30 coffee in a disposable cup \$2.95. The extra cash from sale will go into the green fund. Collaborate with the Cafeteria and books store, green stationary products. Also use of wax paper or an alternative that is greener instead of plastic wrap.
  - Collaborate with Marketing, Business, Art, Digital, Design to Co-Create reusable bags for students and staff use. And have an advertising campaign "Plastic is not cool!"
  - Create a FREecycle Warehouse - people can drop off items that they are not using anymore and can share with other students & families on campus. Have a link on the website where students can search for items that they may want to get rid of or find. Also add all green links in the area.
  - Collaborate with welding, political science to enhance use of bike racks installation and promotion. Blue Bike program - free available bikes on campus, use recycle and give to someone else when needed.
  - Collaborate with janitorial service to ensure use of environmental practices.
  - Collaborate with public transit for bike racks and increased bus transportation.
  - Collaborate with the waste transfer station (the dump/the free store) to reduce or eliminate fees associated with dropping off items.

## Health Services

1.
  - We want to work with people - need a sustainable environment for all living beings.
  - Helping professions are about respect for people, and respect for environment is a close corollary.
  - Climate change will cause stress, people will have financial and other types of difficulty, social work as a profession responds to stressors of various types.
  - Size of families influences the size of carbon footprint.
  - Green initiatives start at home.
  - Level of income effects amount of carbon footprint.
  
2.
  - We are learning to educate children and have the ability to influence the outlook of future generations. (e.g. teach them to ride their bike to the store rather than drive).
  - Model ways to use recycled materials with children. (Toys, crafts, etc.)
  - Implement recycling programs in the centers we work in.
  - Teach children about eating locally and seasonally.
  - Talking about the benefits of eating fresh rather than packaged.
  - Work with our community to model environmental responsibility.
  - Work with clients to help them determine what it all means to them, how they feel about it.
  - We work with groups - could use these skills to brainstorm with groups of people to find solutions, develop more green processes.
  - Social enterprise: create jobs/businesses that foster a green economy. Jobs that can work for people who are marginalized; businesses that support community-based social enterprises that are also green.
  - Carpool pressure on big businesses to develop green technology.
  - More accessibility to transit.
  - Public transit initiatives from big businesses.
  - Initiate greater awareness and new programs to help families go green.
  - Programs to support transportation via bikes.
  - Federal inventory of companies and their green initiatives: new standards and policies to be developed.
  
3.
  - Create a family friendly campaign that is appealing to families with young children.
  - We would get adults and children involved. Get children involved in the campaign by making posters, etc. Children's artwork can be very appealing.
  - Incorporate themes into the curriculum and share the curriculum with the families.
  - "No garbage" lunch policy.
  - We would want to collaborate with forestry, nursing, Kootenay School of the Arts, environmental planning and computer technology.
  - Use analytical skills/critical thinking skills to review programs or lack thereof.
  - Use fear as a motivator: use listening skills to be able to help articulate people's fears, and mobilize them in ways that address those fears (turning bad things into good things).
  - Coordinating speaking events that help raise people's awareness.



## go BEYOND

- Make public any information on green subsidies available to community members: make them worthwhile.
- An awareness campaign on the public who are living on fixed incomes.
- Poor quality of life resulting from climate change and high cost of fuels may influence the amount of illnesses: therefore increasing the amount of \$ needed for services such as hospitals.
- As climate change increases due to fossil fuels being scarce we need to be thinking about individuals and families that are on a fixed income, this may increase poverty.
- Initiatives for wood burning stoves.
- Wood and slash piles available for home heating (prioritize those with low incomes).
- Money for all recycling including cardboard, glass, and cans. Multilevel curbside recycling options.

### Interior Design

2.

- We keep up on the information about building green.
- We are taught about materials and the industry's desire to become greener. What they do to recycle their products.
- We are taught about sustainability and to become leaders in the community.

3.

- We are taught about design awareness.
- We are developing out communication, knowledge and leadership skills to become leaders in our community.
- We would want to involve event planner, trades, city hall, architects, planners, professional such as scientists, provincial governments, and world leaders.
- Marketing is the way to make people more aware of how they can reduce their carbon footprint.

### Tourism

1.

- Promoting travel leads to pollution.
- Parks need to limit the numbers of people going through at any one time. Hotels are trying to be more Eco-friendly.
- Travelling by plane increases personal carbon footprint.

2.

- Show people alternative ways that are more eco-friendly.
- Lead by example.
- Build energy efficient tourist attractions and venues.
- Offer alternatives for laundry etc (line dry).
- Use the key card system to activate power in hotel rooms, when the person leaves they take their "key" with them, automatically shutting down lights, TVs etc.
- Promote/building a "real" passenger train link across Canada (possibly electric), requiring less roads, road maintenance & upkeep, less cars travelling, and probably safer especially in the Winter Season.
- A "take your car with you on the train" system would probably be the most appealing to the NA market.



3.

- Lead by example, show what is already working.
- Use statistics.
- Use predictions for the future of new energy sources and fuels

### III. THE INSTITUTIONS

#### COLLEGE OF NEW CALEDONIA

##### Waste

- Reduce paper products.
- Eliminate styrofoam and plastics in the cafeteria.

##### Education

- Educate younger students about little things that they can do to help cut down on carbon emissions.

#### LANGARA COLLEGE

##### Food

- Create a food court on the concept of the 100 mile diet.
- Cafeteria should serve local produce.
- Turn Langara field into a farm and eat local foods.
- Develop rooftop gardening for food on college buildings.

##### Waste

- Make recycling the norm.
- Give homework and announcement online.
- Use technology: more online resources, no photocopy of handouts.
- Create more water fountains to avoid bottles.
- Reduce the amount of garbage. Supply every household with a recycling box.
- Recycle, re-use & use recycled paper for tests and handouts.
- Discounts in cafeteria for bringing own cup.
- Switch from hand towels to hand-dryers in washrooms.
- Recycling contests.
- Email assignments to reduce paper use.
- Ban disposable cups.
- Increase recycling bins – one in every classroom.
- Re-use textbooks.
- Install low-flow toilets (and sensors that do not trigger flushing several times for one use).
- Get rid of plastic bags at bookstore.
- Use recyclable products in the cafeteria and other food stations.
- A water system in our school so we don't use plastic water bottles.

##### Transportation

- Offer more car-pool parking.
- Fine heavily polluting vehicles.
- Vote for taxation and use money to subsidize fuel-efficient vehicles.
- Establish fines and tariffs for driving on Sundays or downtown.
- Create bike exchange / program lending.
- Increase parking fees.



## go BEYOND

- Encourage more bus travel – more service, cheaper U-Pass.
- Encourage carpooling and bike travel.
- More educational facilities to eliminate travel time.
- Put a portion of the parking fees towards carbon offsetting.
- Free U-passes.
- More bicycle racks.

### Energy

- Use renewable energy at Langara (solar panels, geothermal).
- Motion-sensitive classroom lights.
- Offer free home diagnosis to detect where energy is being wasted.
- Mail energy-efficient bulbs.
- Reduce electricity usage overall (e.g. automated light switches).
- Use solar panels, geothermal energy and other renewable energies.
- Energy-efficient lighting.
- Install solar panels.
- Replace inefficient photocopiers that leak toner toxins and waste paper.
- Unplugging of electrical equipment when not in use.
- Repair inefficient heating/ventilation.
- Better temperature control: reduce power used for air-conditioning, heating.
- Improve building insulation.
- Turn off power to computer labs at night (run power shut-off on a timer).
- Put solar panels on roof (would also have an educational effect).
- Create a fitness centre with cycling machines attached to generators so students and faculty can get fit while generating energy for use at the college.
- More task lighting, in place of overall fluorescent lighting.
- Have a “black” homepage like Google that promotes “earth hour”, an event that encourages energy conservation.

### Education/Advocacy

- Use science and chemistry research.
- Encourage students to think of innovative ways to solve problems, perhaps by offering course credit.
- More education about climate change.
- Use the college community to create opportunities to discuss the issues and mobilize for change.
- High-school students should have a mandatory class on the environment.
- Change government priorities. The average age group at Langara represents the next generation. The Canadian government wants to educate people about climate change so that we “buy in” to the idea of reducing carbon footprint.
- Use the internet to spread the word (e.g. Facebook).
- Use celebrities for the same thing.
- More advocacy for recycling among college population.
- Boycott companies that are not contributing to green initiatives.

### Other

- Make organizational culture climate-friendly.



## go BEYOND

- Both draw attention to control processes and output goals.
- Establish an environmental committee to bring fresh ideas on a regular basis.
- Establish a reward program for people and stores in the community to motivate them to buy and sell environmentally friendly products.
- Use negative reinforcement, shaping: reducing pollution will produce healthier life.
- Allocate more money to R&D.
- Give subsidies to eco-friendly businesses.
- Cooperate with local environmental groups.
- Cooperate with higher levels of government.
- More green spaces.
- Switch to biodegradable products wherever possible.
- Online classes.
- Indoor garden to improve air quality.
- Acknowledge students who are being environmentally friendly.

### **NORTHERN LIGHTS COLLEGE**

#### Food

- We could start a composting program for our lunch waste.

#### Waste

- Also we have to run gallons of cold water before we get water hot enough to wash with.
- We could encourage all classes to compost and recycle.

#### Transportation

- We could help by having a no-idling policy at our campus.
- We could ask students and faculty to walk or ride bikes to the campus.

#### Energy

- We could become more energy conscious about shutting off our lights.
- We open our windows and use fans in our classroom because we can't regulate our heat ourselves. We see a lot of energy loss because of this.
- We could turn down the heat and wear sweaters if we are too cold.

### **NORTHWEST COMMUNITY COLLEGE**

#### Waste

- Encourage the three R's: Reduce, Reuse, Recycle.

#### Transportation

- Impose a bus-system that best suits the college students, or have "car-pooling" days.

#### Energy

- Shut off lights and computers when not in use or unnecessary. Or another alternative would be to place the computers on "Power-saving Mode."

#### Education/Advocacy

- Have seminars to increase awareness and educate the students of Global Warming and how they can deter the effects on our region (and others).

## **SELKIRK COLLEGE**

#### Food

- Plant a campus garden (bear smart - composting), for use in the cafeteria.

#### Waste

- Better accessibility for recycling, more bins.
- Challenge other campuses to Go Green - in measureable amounts - how much garbage per class room per student capita, how much paper is recycled through the year, what happens to the papers from students at the end of the year? Start with our own.
- Measure how much and document actual waste to create quantifiable real targets for real action.
- Create a lunch program where people bring their own utensils, bowls, plates. Eliminate plastic cutlery. Move stainless steel cutlery to the front and have drop off bins!
- Drinking Coffee - Disposable containers, Coffee is transported from far away.
- No more cafeteria food shipped in and wrapped in plastic, etc. Have the cafeteria use biodegradable food containers.
- Don't change textbooks every year just because one sentence has been changed.
- Submit papers and assignments electronically, do electronic grading and feedback.
- Lug a Mug: difference between cost of paper cup and using own cup towards college green fund.
- Pressure on stores to use less packaging and to use biodegradable packaging when available.

#### Transportation

- More on-campus housing available to cut down commuting financial and environmental cost.

#### Energy

- Explore wind turbine to create energy in the college. Connect with renewable wind resources.
- Reduce electricity that is used during our night classes outside of regular hours.
- As a school, we can model better energy consumption, using renewable energy resources (solar panels, wind).
- 'Green' roofs on flat buildings.
- Change glass in hallways to reduce heat loss.
- Use solar energy on campus.

#### Education/Advocacy

- Increase awareness of climate issues and the surrounding beliefs, values, attitudes, and actions.
- Increasing awareness of disposable products and their reusable counterparts (cloth bags vs. disposable plastic).
- Reminders in public places on how to conserve resources such as water and power.
- Have a green team at each college within each discipline.

#### Other

- College policy to buy from green suppliers. And encourage instructors to reuse textbooks of the same edition.
- Organic green stationary products for teaching and learning.

## SIMON FRASER UNIVERSITY

#### Waste

- More shrubbery, low-maintenance native plantings should replace the old-fashioned expansive fields of grass (e.g. adjacent to Maggie Benson building) that are still being mowed with GHG-emitting-gas mowers.

#### Transportation

- Lower the price of a U-Pass (bus pass).

#### Energy

- Improve insulation in the buildings; reduce over-heating.
- Translink should increase the number of the longer “accordion” buses in its fleet that make the daily circuit up and down Burnaby Mountain. Pilot some electric buses, too.
- Better conservation practices in classroom, labs, and offices are still needed, like using less paper, turning off unused equipment.
- The university should pilot some solar powered buildings/equipment. Lots of sun shines on this mountain for at least 4 months of each year.

## THOMPSON RIVERS UNIVERSITY

#### Food

- Provide a green cafeteria featuring locally grown (organic) food.
- School-wide composting.
- Community garden on campus.
- Vegetarian Days or Hundred mile Diet days at the Culinary Arts center where recipes are provided so that students have ideas for cooking vegetarian at home (once or twice a week even).
- Community kitchen club funded by the university.
- Get rid of the lawn and plant vegetable gardens (stop wasting water) to supply the cafeteria.

#### Waste

- Provide more recycling containers—readily accessible in every classroom and building.
- Reduce the use of water by xeriscaping more parts of the campus.
- Support faculty initiatives for paperless classrooms.
- Compost on campus.
- More recyclable products.
- Require Tupperware and no disposable food dishes.
- Instructors can reduce paper distribution through electronic notes and handouts.
- Recycling notes we do receive.
- Use the whiteboard instead of a flipchart.



## go BEYOND

- Go to an Aboriginal way of passing down knowledge, verbal only.
- No textbooks or exams that use papers.
- Online collaboration of students/teachers, using less paper.
- TRU-OL should provide incentives to take web, not print-off courses.
- Only use recycled paper.
- Use flush-efficient toilets.
- Post class materials online. This will reduce the amount of paper used.
- Post university newspapers online.
- Use of water meters.
- Limit water use.
- Grey water recycling.
- Better recycling on campus and in dorms.
- "No home for Styrofoam" at TRU (and any other non-environmentally friendly food containers and biodegradable/recycled utensils).
- Biodegradable/recyclable bags.
- Permanent recycling bins (for more than just cans and bottles) beside EVERY garbage can.
- Biodegradable containers only from Aramark and Culinary Arts.
- No more bottled water for sale on campus.
- Limit the amount of printing required per class.
- Appealing tap-water sources.
- Kamloops should be a recycling center.
- Reduce water waste in labs.
- Mandatory to have all business use biodegradable food packaging.

### Transportation

- Use local materials and businesses to supply the materials for all new buildings.
- Improve accessibility for public transport by lobbying the city to better match students' schedules.
- Encourage the use of alternative transportation in an effort to meet the 2010 target of carbon neutrality.
- Car pooling and public transportation and bikes.
- Lobby for more effective/efficient transportation (public).
- More covered bike racks on campus.
- Incentives for students to bike/bus/walk/carpool to TRU.
- Public transit to run for longer hours and more bus stops on campus and at peak times.
- Limit the number of parking spaces; use shuttle buses to and from the university.
- Offer more online courses for those individuals who live outside of the city. This could limit the amount of cars that would travel to and from the university.
- Making carpool parking lots.
- One parking pass for multiple vehicles.
- Use roundabouts and make more pedestrian areas.
- Improve bike routes.
- Better school schedules (less breaks means less driving home).
- Better university-provided vehicles to reduce number of cars driving on field trips.
- Cafeteria should focus on local food – less transportation and therefore gas burnt.



## go BEYOND

- Housing closer to school.
- All facilities/ university vehicles should be hybrid or electric.
- Parking fee structure where people who live close (i.e. can walk) have to pay more than people who need to drive.
- Improved bicycle – friendliness of the city (bike lanes, more bike racks on buses – enough for each passenger).
- More bike paths to school, from North Shore/Valley View- (maybe through Peterson Creek).
- Improve bus service (safer at night and more effective schedules).
- Have a little card that makes it easy to sign up for a car-pooling system.

### Energy

- Use alternative sources of energy—solar panels, wind turbines—to replace fossil fuels.
- Get better control over heating and air conditioning in existing buildings.
- Emphasize energy reduction with private operators of student residences.
- Increase the insulation in the buildings.
- Add geothermal heating and cooling.
- Have class during the day so we don't need to use lights.
- Eco-friendly light bulbs.
- Alternative energy sources for buildings on campus.
- Build green buildings.
- Environmental upgrades to older buildings on campus.
- Remove the televisions that are located in most of the hallways within the school. They are a waste of energy.
- Photovoltaic windows.
- Develop a "green roof" plan for some of the new buildings that are currently being developed.
- Subsidies for energy efficiency.
- Plug energy back into the grid (e.g. exercise bikes at gyms).
- Make buildings more energy efficient (better insulation, geothermal heating, reduce temps, wear coats, change albedo of buildings (darker for winter), solar panels, wind generation on roof.
- Air conditioning is unnecessary year round (open windows work just fine).
- Natural light.
- Auto lights (only on when movement detected).
- Requirements to turn off any electrical equipment (lights, computers) when not in use.
- Bring back the clothes line, Kamloops is very dry.
- No more coolers on water fountains.
- Less vending machines.
- Light/heat sensors in buildings.
- River-powered energy using current.
- Improve insulation using new materials.
- Compost heating (run pipe of water through compost and use it to heat swimming pool).

### Education/Advocacy

- Provide more courses to learn about environmental issues.
- Require that fourth year students take an environmental awareness course.
- Educate for awareness.



## go BEYOND

- Campaign to change the mentality about big vehicles (i.e., Gas-Guzzling Isn't Cool Campaign).
- Campaign to reduce plastic use.
- Public lectures on campus (not about climate change, but about what individuals can do).
- Speaking at elementary schools.
- Make sweaters back in style... ugly sweater days, when the school's temperature is lowered.
- Carpool campaigns, as Kamloops is a very spread out city, and students often don't know one another.
- Every program having a mandatory local 'green' class, teach new students where they can buy local produce, and about green initiatives that Kamloops already has underway.
- Protest! Our campus/community is behind – better bus routes, recycling programs, 'green' buildings.
- Monetary rewards for reducing waste (eg Tim Horton's cups.. Bring your own and get discount).
- Encourage immediate change.
- Create a website that shows what green actions we are doing - network for sharing information and ideas.
- Affect political change (self-sustainable university?)
- Model change.
- Use our education to promote research and encourage studies that relate to climate change.
- Educate younger people (elementary age).

### Other

- Reduce the use of gas-using appliances by maintenance staff—replace with hybrids or rechargeable ones.
- Hold each other accountable.
- Each class/student plant a tree.
- Get rid of Aramark food services.
- Think 'green' when putting on functions.
- More funding to TRU ECO Club.
- Include a chemical treatment facility to safely neutralize harmful materials that are used frequently by chemistry and biology students.
- Encourage urban forestry.
- Eliminate drive-thrus.
- Green trade programs in universities.
- Adherence to KamPlan (high density housing and development).
- More diverse, low-cost, near-campus housing. Consider multiple-use apartments as opposed to single-room residence model.
- Carbon tax, as long as money goes to increasing sustainability and not just general revenues.
- More community based residence (community kitchens).
- Creating a more appealing atmosphere for students to live on campus in 'towns/villages'.
- Sustainability paid positions (currently there is just one).
- Use open-source software and use money gained towards environment.
- Promote rewards systems for both students and faculty based on their contributions to solving problems like climate change.

## UNIVERSITY OF BRITISH COLUMBIA

### Food

- Grow farm, promote eating locally, and increase composting (more accessible, not just in food places).
- Preserve UBC Farm (and serve the produce on campus)
- More local sourcing of food options.
- Insist on local food.
- Buy and use more local “home-grown” produce.

### Waste

- City composting program – widely available.
- Adopt program like in Ontario where composting is picked up in green bins by city waste management.
- Course materials online/web-based.
- Recycle notes.
- Save paper (do we really need to print off lecture slides?).
- More recycling bins around the school for greater convenience.
- Improve recycling and use resources more efficiently (water, paper free classes and offices, electronic assignments and turn-ins, compostable containers and cups, low flush toilets, low flow faucets, energy efficient lighting on motion sensors, better insulation).
- The school should work with vendors to help reuse or reduce disposable or packaging materials.
- Professors should rely on sources that can be shared via the internet, reducing the need for printed textbooks.
- Don't sell bottled water.
- Don't use plastic utensils.
- Move towards paperless environment.
- Recycle our batteries, cell phones, printer cartilages, and any type of drink container.
- Greener options for lab equipment (recycled KimWipes, plastics recycling).
- Sell reusable containers for lunches in Student Union Building.
- pdf versions of textbooks that are easily searchable.
- Free mugs for everyone (get rid of paper cups on campus!)
- Eliminate paper money (we can use cards, etc).
- Always use double-sided photo copies.
- Papers could be electronically submitted.
- Redistributing resources (using leftover sawdust as an energy source).
- Encourage more use of re-usable containers.
- Ban on use of single-use cups.
- Free composting bins in residences.
- Fines for waste.
- Complete ban on plastic bags.
- More electronic books.
- Getting rid of paper towels in residence.

## Transportation

- Public awareness: bike incentives.
- Co-op bike program.
- Increase transit system – change so it is not just status to have car – *opting to not* drive, economic to use transit (e.g. NY subway system).
- Community-based UBC specialty instruction (Law in Kerrisdale, Human Kinetics downtown, etc. - allow students to relocate to specialized area, lessens need to even use transit).
- Teleconference discussions – seen today in distance education (DE&T) courses that are paper-based (e.g. PSYC 320 – Psychology of Gender).
- Lobby for rapid transit line(s) – Skytrain (powered responsibly) – Shut down Broadway corridor.
- Promote biking (e.g. France: city bikes, deposit quarter, retrieve quarter when return to any station on any street – can Google).
- Reduce transportation-related carbon costs by promoting: local businesses to provide for UBC, local food, rapid transit to UBC, on-campus housing, bicycling (bike lanes and improved bicycle security – use bait-bikes!)
- Eliminate any fees for the U-Pass to make it an even stronger incentive to bus rather than drive.
- Parking on campus could also be raised, while the public transit system could be improved in frequency.
- People should drive less- parking should be taxed more – less parking tax (depending on the number of people in the car – say \$30.00 for one person and \$5.00 if the car is full)
- Carpooling – produce a university list of all students that commute from different areas- give this list to other students so that they can take turns driving- not all cars used at the same time. This would have environmental benefits as well as social!
- Limit number of registered cars per household (say only 1 for a family under 4).
- Make cars illegal on campus.
- Rickshaw drivers.
- Free bikes for everyone!
- Affordable housing on campus would lower need for students to commute.

## Energy

- UBC energy infrastructure (get off fossil fuels) – Solar power, bio-diesel/fuel, etc.
- Outfit classrooms with energy-saving light bulbs.
- Greater use of technology (e.g., laptop computers) for note-taking, studying, etc.
- Plant more trees, build green buildings, and install green roofs.
- Turn off lights/power-bars to reduce electricity.
- Include environmentally friendly initiatives into renovations (solar panels, more glass for natural sunlight, etc.)
- Hold some classes outdoors.
- Greener heating and cooling options in buildings that are constructed on campus.
- Turning off lights in buildings and rooms that are not being used (night-time).
- More efficient energy sources- less bright lights.
- Explore opportunities for local power generation (i.e. Potential tidal power right beside UBC Vancouver campus).
- Upgrade buildings so they are more energy efficient.
- At night there are so many buildings with the lights on and the heating.

- Buchanan tower has a program where you can see how much energy is consumed in the building.
- Technology is the way to become more energy-efficient---discover which ones are available now and implement them commercially and economically through each faculty.
- Promotion of sustainability—buildings---if UBC is pushing it out to the community and leads by example, others should hopefully follow suit.
- Change lights to compact fluorescents.
- Use renewable energy resources.
- Use people to make power, like in the gym, use treadmills and bikes to power lights, computers etc. And create hand-held chargers for things like ipods and desk lamps.

#### Education/Advocacy

- More education about what sustainable options are around UBC campus for recycling because sometimes there is confusion around what to do.
- Put more information about different policies that would make people feel like their smaller contributions matter (e.g., if there are 40,000 students living at UBC and each one of them turns off the lights when they are not home, what would that mean in terms of total energy saving?).
- Raise awareness. Be a centralised source of information on how to reduce climate impacts.
- Assign a team to focus on climate change and update the community or media.
- Create a mandatory course for environmental awareness.
- Student ad campaigns.
- Mandatory environmental education (from pre-school).
- Those of us in arts can use the media to put our ideas out there.
- Use UBC farm issue to raise awareness about the importance of smart land use planning.
- As students we learn a lot of global, warming but sometimes we don't follow through. If there was a class where you could do field studies, or volunteer, do a change, to give 1 credit to a student. Volunteer hours, a required course.
- Invite people or company from the environmental field to give conferences or seminars.
- Promote more green living options on campus.
- Run education programs about climate change in primary and secondary schools within our community.
- More promotion of "blackout" days where everyone avoids using any power.

#### Other

- Web-based instruction/community.
- Include community service as part of credit for students within their specialties, aiding community while gaining work experience valid to future career.
- Encourages students to stay in Vancouver/Canada to help community as they would feel a part of the community.
- Social networking website.
- Rewarding students for engaging in climate-friendly activities.
- Research – particularly interdisciplinary research – to explore alternatives and find realistic solutions.
- Our school can collaborate with other companies to reduce the prices of green products.
- More events (beach parties, conferences, etc).
- Stop construction of private housing on campus.
- BC is one of the biggest pulp and paper mill producers/providers.
- Bio-degradable cleaning supplies.

## UNIVERSITY OF NORTHERN BRITISH COLUMBIA

### Transportation

- Transit incentives; make U-Pass available to faculty and graduate students.

### Energy

- Geothermal, solar, wind energy.
- Green roofs.
- Glaze the windows.
- LEED standards for future buildings.
- Retrofit residence buildings.
- Snow storage—use it for cooling in the summer.
- School is already built for passive solar.
- Geothermal heat pumps.

### Education/Advocacy

- Educate all disciplines.
- Biology program could focus more on biological impacts of climate change.
- Educate through physical attributes of the campus, waste management systems and energy use to lead by example – students will learn from this.
- University should be a role model.

### Other

- Permeable pavement.

## UNIVERSITY OF VICTORIA

### Food

- Don't just eat locally, consume locally (all products).

### Waste

- Instead of plastic or biodegradable shopping bags, encourage locally produced cloth bags.
- Develop composting and recycling sites for apartment/condo dwellers.
- Focus on reducing use as much as recycling and reusing.
- Stop watering grass on campus, and look for ways to introduce permaculture at the university.
- Sponsor clothing exchanges on a regular basis.
- Less paper (e.g., default double-sided printing), more wireless, more recycling.
- Less disposable materials in cafeterias; put a tax on disposables.
- Look at using things like rock gardens instead of lawns to reduce need for watering in the summer while simultaneously highlighting different cultures.

### Transportation

- Expand bike lanes throughout the city.
- Expand bus services.
- Create secure areas to lock bikes.



## go BEYOND

- More bike racks, better bus schedule/routes, better bike lanes; showers in all buildings to encourage biking / alternative transportation.
- Make it impossible to park cars here!
- Get cars out of downtown.
- Affordable houses for students to reduce commute.
- Reward people who work here year round who DON'T park with a \$150.00 bonus (this has worked at other universities).

### Energy

- More green roofs, redesigning buildings.
- Setup all campus computers to autosleep after short time of inactivity.
- Switch to renewable energy providers for power on campus.
- Lower ambient temp in buildings.
- Don't force people to take elevators.
- Looking at insulation and heat and rethinking the way it is distributed; turning down all heaters at night, give the students and faculty a challenge of reducing power usage by, say, 50% through turning off lights, turning down heaters, improving insulation, using sunlight and closing drapes to keep out cold.

### Education/Advocacy

- Harness the minds that are available on campus.
- Take things seriously - lead by example; get message out to the general public.
- All classes should be doing teach-ins such as this one.
- Tours on campus for the public to see changes.
- Avoid business-as-usual attitude; stop focusing on the unimportant and solve problems of the here and now.
- Collaborate across faculties; establish a common climate change theme across disciplines; improve connections between people and create spaces to share ideas; dialogue and advocacy in all faculties.
- Talk to municipal government.
- Bring in environmental engineering courses.
- Multi-disciplinary communication (more facilitation, i.e. a joint major b/w econ and environmental studies).
- Work on changing social attitudes: fine extra containers, looking back to when coffee cups were expected to be reused (early twentieth century).

### Other

- Slow down our lifestyle in general.
- Focus energies on climate change; even smarter growth than there has been.
- More water fountains versus pop machines.
- Bring in government-funded green projects.
- Find out what the largest carbon contributors are and allocate resources to them.



## VANCOUVER ISLAND UNIVERSITY

### Transportation

- Creation of larger car pool parking lots and a parking permit system that makes it easier to realize an economic incentive from carpooling.
- The need for a 'U-Pass' bus system similar to that of other institutions, where bus passes are included with the student fees. There was a strong indication that this should be coupled with improved service requirements.

### Energy

- Promote the use of green building materials and principles in new construction (e.g., less concrete, more natural light). Perhaps these could include demonstration sites on campus (e.g., photovoltaics).
- Departments working with Facility Services on campus may be able to effectively manage ventilation requirements to improve energy efficiency. Minimizing the use of fumehoods during low use periods can result in significant energy savings. We propose that in consultation with the Health and Safety Office, informational signage could be placed on fumehood sashes that covers each department's individual shutdown or ventilation reduction procedures and outlines the carbon savings in term of equivalent number of vehicles taken off the road. New fumehoods should be equipped with variable speed fans to reduce flows during low use periods.

### Education/Advocacy

- We propose that the institution undertake the development of an inter-disciplinary 'global systems' survey course. The course could be at an introductory level and applicable to all students in all disciplines at the institution. We recommend that it be team taught by faculty specifically selected based on their ability to communicate effectively and passionately on the topic. It should include a variety of perspectives including the scientific, social, economic and political implications of climate change. We would like to see the institution take a leadership role and consider the possibility of making this a mandatory survey course that may be used in partial fulfillment of general Science and/or Arts degree requirements.

## YUKON COLLEGE

### Waste

- Increase awareness of the compost program in the cafeteria and expand it to the residences.
- Ensure that the brand new family residence has a regular (bottle, can, paper) recycling program implemented.
- More recycling receptacles around the building.

### Transportation

- Promote carpooling, possibly by charging a fee for the parking, or an incentive (like a percentage off your books) if you reduce your vehicle use.
- Raise awareness of bike lockers by putting information in student orientation package, posters, signage on the lockers themselves.

### Energy

- Become LEED Certified.

- Encourage people to study and develop LEED technologies and building techniques, particularly in the Carpentry program.

#### Education/Advocacy

- General education about climate change; communication strategies to use when people try to shut you down and say that climate change is a myth; what it really means; how to recognize the long-term effects vs. brief flips in the daily weather; get some general, basic, agreed-to basic "statements" on climate change that can be repeated over and over until people understand the science and why it's important to spend big money on it.
- Finding ways to facilitate individuals to make a difference in their daily lives through a supported, educated environment.
- Encourage other people to find out their ecological footprint, like a TV commercial that shows how little changes can dramatically reduce ecological footprints. Realistic, easy to understand commercials that add up to major changes.
- Specifically, the College can bring in speakers, develop more courses regarding the issue, students can collaborate in a conference setting, students going into secondary and primary schools, co-op work.
- Develop more courses.
- Make recommendations to government for policy.
- Encourage the student body to be involved in local educational programs, like in the secondary and primary schools.
- Expand Environmental Studies program to a 4-year degree.
- Add an environmental element to existing courses, for example in Automotive one day could be dedicated to environmentally friendly practices in the auto shop.
- Opening a dialogue with the City of Whitehorse regarding improving the bus service to the College, renewing the Student rate for the bus pass, evening service, smaller buses, more energy efficient buses.
- More YC-led research and publications, including research that stays in the Yukon.
- Lobby for internships at local environmental agencies.
- Form a group to go into elementary and secondary school to teach environmental awareness.
- Form a student lobby group (labeled any way) to make their voices heard, especially when it comes to allotment of money by government.
- An environmental email distribution list (listserv) for students as a clearinghouse of information on local events, awareness campaigns, and other opportunities.

#### Other

- Offer free accommodations in the College for environmental activities, like speakers and other public events.
- Expand research facilities to provide storage facilities and research space for researchers. Invite experts to speak on climate change issues.