February 15, 2007

submitted to

Teaching for High Potential, National Association for Gifted Children

Global Climate Change - Motivated High School Students Gain their Voice

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With the snow-less winter of 2007 drawing to a close over much of the United States only two years after Hurricane Katrina slammed into New Orleans, human-induced climate change is on everyone’s mind. Release of the authoritative United Nations-sponsored Intergovernmental Panel on Climate Change report in February 2007 confirmed for policy makers what most scientists have known for years; humans are changing the world’s climate by running the biggest uncontrolled global experiment in history. Burning fossil fuels and slashing tropical forests, we have increased atmospheric levels of CO$_2$ by $>30\%$ since the dawn of the industrial revolution and unless something changes quickly, CO$_2$ levels will have doubled or tripled by century’s end. Climate models suggest the world will by then be 2 to 10 degrees F warmer on average, permanent sea ice will have vanished, and the great ice sheets of Greenland and Antarctica may be in irreversible decline.

How does an exceptional young person deal with such a dire forecast without losing hope, and how does he or she avoid becoming mired in a cycle of inaction and helplessness? To address these issues, faculty of the Governor’s Institutes of Vermont, a seven-program group of summer residential Institutes that caters to high-potential learners, developed a weekend climate change program. The program brought together 70 of Vermont’s most motivated high school students, nearly a dozen staff, and 18 visiting specialists for a Winter Weekend of learning and action. The overarching theme of the weekend was to understand global climate change from a variety of perspectives, get a sense of the science, as well as a sense of the politics involved. After learning the basics, the students worked with faculty and outside specialists to learn about solutions--personal, local, and global. Throughout the weekend, we stressed the importance of not giving up hope, of taking action, and of finding one’s own voice to speak about this compelling issue.
Our Approach

We explicitly designed the Focus on Global Climate Change Weekend to cross what are typically considered disciplinary boundaries and to build on previous programmatic knowledge. We had seven objectives for the weekend:

1. increase student awareness of human-induced climate change,
2. increase student knowledge about the science underlying changes in climate,
3. catalyze student reflection on new information and ideas to which they are exposed,
4. provide skills, knowledge, and support to allow students to make changes in their lives and their families lives that minimize human impact on climate,
5. catalyze action by students to provide positive societal change,
6. model ways of learning outside the classroom setting, and
7. support students as they accept and acknowledge the problems posed by human-induced climate change.

Over the past decade, the Governor's Institutes of Vermont residential Winter Weekends have always had students and faculty working in separate, topically-focused groups. The integrated approach we took this year was the result of both faculty and student interest in approaching the pressing problem of climate change through an interdisciplinary lens. Crossing disciplines allowed us to attract a variety of students and appeal to a variety of learning styles. Recruiting was done on a first come/first served basis through high school guidance counselors. The demand for the program greatly outstripped the number of available spots with registration closing weeks ahead and numerous students and teachers turned away.

The planning process for staff required several group meetings and conference calls to create cohesion among the faculty, discuss curricular goals, create a working schedule, and discuss reading materials for the students. We created a pre-weekend packet of activities for all students and staff to complete before arriving that included: 1) a short reading packet with science, newspaper, and popular book excerpts, 2) a graphic “footprint” collage of household energy use on 11x17 paper, and 3) a calculation of household carbon emissions. Staff also created a carpool list for students and visiting speakers to encourage the reduction of carbon emissions. All of these materials are available at the Winter Weekend website (http://uvm.edu/giv/givwinter2007).

The overall structure of the weekend moved students intellectually from learning facts toward reflection and then taking action. Students arrived on Friday afternoon and were immediately immersed in the issues and the science. We opened the weekend with a local champion of climate change action, the President Pro Tempore of the Vermont State Senate. The senator was followed by a local expert, a geologist who studies regional climate change and climate history. We used the carbon footprinting exercise as an icebreaker for the students and closed the evening with Too Hot Not to Handle, a movie that moved beyond statistics to action and solutions. By the end of the first evening the problem was clear, the importance of taking action had been well articulated, and the students were starting down the pathway from learning facts to taking the steps necessary to make change.

The footprinting exercise provided information we used immediately. For example, from the footprints, we calculated the number of lights contained in all the
student and faculty homes (see the graph below). Of the nearly 3000 installed bulbs, over 2/3 were still incandescent. A simple calculation showed the students that just by swapping out these incandescent bulbs and replacing them with energy efficient compact fluorescents, we could save ~ 40,000 kilowatt hours of electricity each year, representing the typical electrical use of 6 Vermont households, which use on average 7000 kilowatt hours per year! If we use the estimate that 2 pounds of CO$_2$ are released per kilowatt hour of electricity used, then changing these 2000 light bulbs could reduce our collective emissions by 80,000 pounds per year. That’s the equivalent of between one and two household’s average yearly carbon emissions – a big change, simply done.

A very important aspect of the interdisciplinary Winter Weekend, not only pedagogically, but in terms of empowering students to respond to critical global issues in their own lives, was providing them with intensive exposure to different perspectives that would allow them inroads for learning about the reality of global climate change and finding ways to appropriately take action in their own lives and communities.

On Saturday morning, students worked closely with faculty in disciplinary groups considering the Science of Climate Change, gaining a voice in Performing Arts, understanding themselves in the eco-psychology of the Body-Earth relationship, and learning about policies in Current Issues and Youth Activism. These four strands provided students with the scientific foundation to understand potential policy advocacy and social action responses at a political level. The strands also allowed them to explore the reactions and emotions that can create denial or paralysis in the face of an overwhelming environmental threat. Students experimented with artistic expression as a holistic and inspiring medium for raising consciousness and mobilizing local action to this global threat. During the afternoon, the students rotated between disciplines so they all met and worked with faculty having different expertise.

In Performing Arts, theatre skills helped young people confront this daunting problem by helping them acquire a clear, persuasive voice and project a positive, open attitude even to the last row of the audience. Students learned specific techniques to access our own emotional experiences, as a way to identify and work with feelings that a global problem of such immensity brings up in us. They tapped into energy that will help them be leaders in the coming social changes that global warming requires.

In the Science of Climate Change, students investigated the global carbon cycle, current and future fuels (their characteristics and carbon-intensity), and the greenhouse effect. They worked in small groups and created large posters in order to do peer
teaching. A subgroup of students used portable watt meters to measure the electrical power use of common household and campus appliances – assuming the persona of guerrilla energy efficiency experts as they monitored soda dispensers and microwaves. These meters allowed a graphic demonstration of the efficiency of compact fluorescent lighting.

Through the strand BodyEarth, students connected climate change to their own lives, to who they are, and to how they interact and experience the environment around them. Through engaging all their senses, the students experienced the reality that we are living organisms in relationship to and part of the planet, that reducing our carbon footprint is not an action to fix some big problem beyond us, but to address our own health and well being and the health and well being of everything we hold dear. Activities included movement, discussion, and quiet reflection, being in the woods, and possibly the silliest and most fun activity, eating cake to connect and appreciate how our bodies rely continuously on what the earth provides. This strand helped bring balance and integration to the students by providing them a place to express and experience their feelings amidst a packed schedule of electives and presentations on global climate change.

In Current Issues and Youth Activism, students assessed how they could take effective political and social action locally to respond to this global threat. They practiced being able to speak knowledgeably and convincingly about the scientific evidence to skeptics or to the uninformed, and role-played strong verbal arguments for policy changes. In Socratic discussion, they explored the disconnect between the overwhelming scientific evidence for global warming and the apparent inaction, denial, and/or paralysis of politicians who are not addressing the threat. They deepened this understanding by analyzing the perspectives, interests, and motivations of various stakeholders in the debate by role-playing. In small groups, they researched the efforts of those who have been taking political action. Students made recommendations for action at the national and state policy level and by designing peer-education programs.

Outside specialists were an important part of the curriculum and brought new and different ideas to the Institute. We recruited local specialists who could speak with the students in small groups regarding “solutions” to the problem of climate change. Students were able to choose and spend 35 minutes each in six of the 22 workshop offerings. These workshops touched on diverse aspects of politics, policy, science, conflict resolution, communications, outreach, media, alternative energy, conservation, transportation, sustainability, local farming, and the arts (http://uvm.edu/giv/givwinter2007 has a complete list of speakers and their topics). The goal of these rotations was to expose students to a wide range of ideas and people while showing that many people were already taking meaningful actions to address climate change.

We ended the activities with Five Steps Forward, an exercise where the students developed personal action plans detailing what positive steps they would take personally and in their communities to affect change. We closed the weekend with a ceremony where students presented to their peers using a variety of means including puppetry, murals, and performance. The ceremony concluded with the students and faculty standing up to declare their commitments for change followed by a graduation where each student received their diploma, an energy-efficient compact fluorescent light. Students left with the feeling that they were on their way to developing enough self-confidence to be effective public speakers for this issue they feel so passionately about.
Outcomes

The outcomes were overwhelmingly positive and can be evaluated two ways. We did formal assessment that blended knowledge and attitude surveys administered before and after the weekend. Students were asked to self-assess their knowledge and attitudes on a 1-5 scale that ranged from *I don’t have a clue* to *I know exactly* (see graph below). From these surveys, we learned that the weekend cohort was already motivated and knowledgeable. Their biggest gain (1.5 pts) was in their knowledge of evidence for climate change in New England, the topic of our keynote speaker. Students came into weekend very willing to take action (4.6 pts) and made least gains there (0.1 pts). They made large gains in their understanding of how humans change climate (the science strand), how climate change could affect Vermont (the keynote speaker), how to take action (all strands and workshops), and how to reduce emissions (specialist workshops).

Anecdotal written student responses tell the story and repeatedly mention the amount they learned, how the Winter Weekend changed them personally, and how it primed them for action.

*This weekend was the most motivating, inspiring, incredible weekend of my life.*

*With the information I gathered, I will be prepared to create positive change. I feel enlightened.*

*This weekend gave me more faith in my generation. It was nice to be with people who are all working for the common good.*
It was depressing and encouraging, liberating and frustrating, hard and fun.

That the adults had so much confidence that we could change the world.

Enjoyed learning the ways I could help personally.

I met incredible, passionate students and collaborated with them to make change. Incorporating art and science was important. It’s great to see it addressed with different subjects.

Issues for the students and some faculty included a change in approach from previous Winter Weekends as well as information overload, lack of sleep, a need for more hands-on activities, and requests for more time to openly discuss issues with their peers.

The broader community responded well to our program. The President of the Vermont Senate asked to speak to the program’s young adults, taking time out of his very busy schedule to open the Winter Weekend. Our recruiting efforts for outside specialists generated much interest. The adults who presented workshops felt it was an important goal for them to reach a young, motivated audience. We provided a small honorarium and invited the specialists to meals, but the fact that most took time on a weekend to be with the students, speaks volumes. The media also responded to press releases, with at least one on-site newspaper reporter and one local television crew appearing over the weekend.

We encourage anyone interested in running a similar program to examine the Winter Weekend website at http://uvm.edu/giv/givwinter2007 and to contact the authors of this paper. Putting this all together took many people, many months but the results were worth it. We are catalyzing change and empowering students to make change. Here’s how one student summed up the weekend.

[The] weekend was excellent and changed my life….I’m inspired; I want to make people listen to me and listen to global warming. Before I came here I didn’t know a lot about global warming. We hadn’t spent a lot of time talking about it in school and I wasn’t very concerned. I want to walk out of here and start to make a difference, and I want to get started NOW.

Important Links

The Governor's Institutes of Vermont (http://giv.org), a member of the National Conference of Governor's Schools (http://ncogs.org), has served more than 7,000 highly motivated students from virtually every high school in the state since the Institutes were established in 1982. Many gained the confidence and encouragement to be the first in their families to go on to college. All came away knowing themselves better, more clearly defining their capabilities and goals, and seeing the world in a new and brighter light. The Institutes open the world to talented Vermont students.
**Short author bios**

**Paul Bierman** ([pbierman@uvm.edu](mailto:pbierman@uvm.edu)) is a Professor of Geology and Natural Resources at the University of Vermont. Now in his 13th year as a faculty member of GIV, he teaches both in the summer and winter Institutes. He has a BA degree from Williams College and his Ph.D. from the University of Washington.

**Peter Gould** ([gould@sover.net](mailto:gould@sover.net)) has a doctorate in interdisciplinary studies from Brandeis, and has performed and taught politically-engaged theatre for 25 years all over the United States. He teaches Spanish at Marlboro College and the School for International Training, and works with young people at the New England Youth Theatre, the Governor's Institute on the Arts, and his own Get Thee to the Funnery Shakespeare camps in northern Vermont.

**Jasmine Lamb** ([jasmineopal@verizon.net](mailto:jasmineopal@verizon.net)) has worked as the Director of Student Life for the Governor’s Institute on the Arts for many years. She is a mediator, teacher, and writer living in Montpelier, Vermont. Her growing passion is in what she calls ListeningArts, which uses movement, writing, storytelling, and stillness as ways to expand our capacity to listen to ourselves and others.

**Christine Massey** ([christine.massey@uvm.edu](mailto:christine.massey@uvm.edu)) works on science education initiatives in the Education and Geology Departments at the University of Vermont. She directs the high school Science & Technology Governor’s Institute, in both summer and winter, and directs the UVM Perkins Museum Environmental Science Day Camp for elementary students. Christine holds a BA from Carleton College and an MS from the University of Washington, both in Geology.

**Simon Norton** ([simon.norton@sit.edu](mailto:simon.norton@sit.edu)) has been the Co-Director of the Vermont Governor's Institute on Current Issues for Youth Activism and the Program Director of the S.I.T. Youth Peacebuilding and Leadership programs since 2001. He lives in Brattleboro, Vermont, and teaches global issues, civics, leadership, peacebuilding to youth from all over the world. Simon holds a B.A. in International Studies from the School for International Training and a Masters in Education from the Harvard University.

**Jean Olson** ([giv@sover.net](mailto:giv@sover.net)) has been Executive Director of the Governor's Institutes of Vermont since 1994. She is currently a doctoral student at the University of Vermont researching the academic, social, and emotional needs of high-potential learners and is also the President Elect of the National Conference of Governor's Schools (NCOGS).

**Luke Reusser** ([lreusser@uvm.edu](mailto:lreusser@uvm.edu)) is a doctoral student in the Rubenstein School of Environment and Natural Resources at the University of Vermont. Through his research, he investigates the impacts of human activities on natural rates of landscape change and erosion along both the U.S. Pacific and Atlantic coasts, as well as the north island of New Zealand.

**John Ungerleider** ([John.Ungerleider@worldlearning.org](mailto:John.Ungerleider@worldlearning.org)) is a Professor of Conflict Transformation at the School for International Training in Brattleboro, Vermont. He directs SIT's International Youth Peacebuilding Camps and the Vermont Governor's Institute on Current Issues and Youth Activism. ([www.sit.edu/youth](http://www.sit.edu/youth)) A former Fulbright senior scholar in Cyprus, Professor Ungerleider founded the Child Labor Education and Action (CLEA) project for Vermont teens working to fight oppressive child labor around the world.