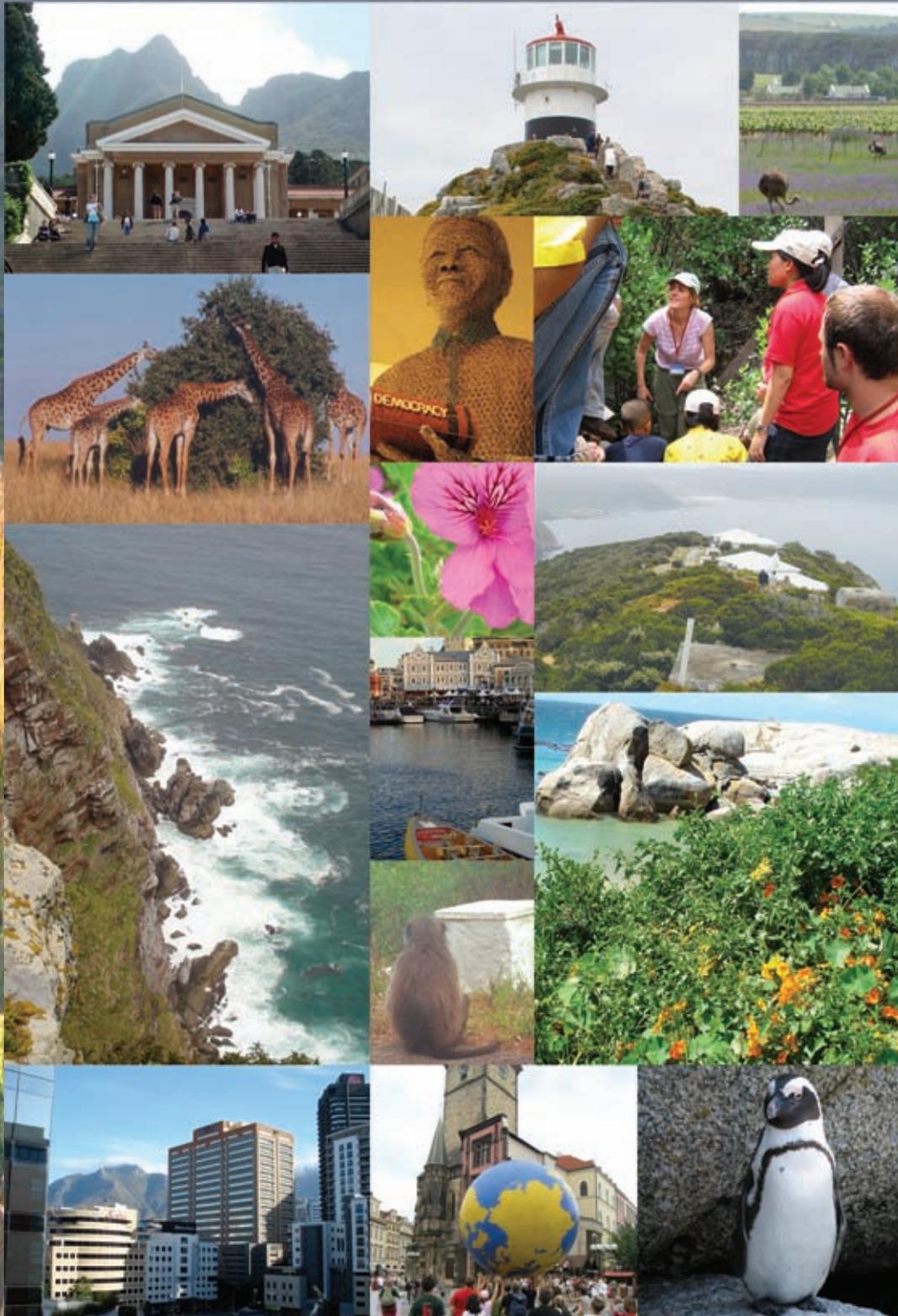




# GLOBE LEARNING EXPEDITION



22 - 27 June 2008

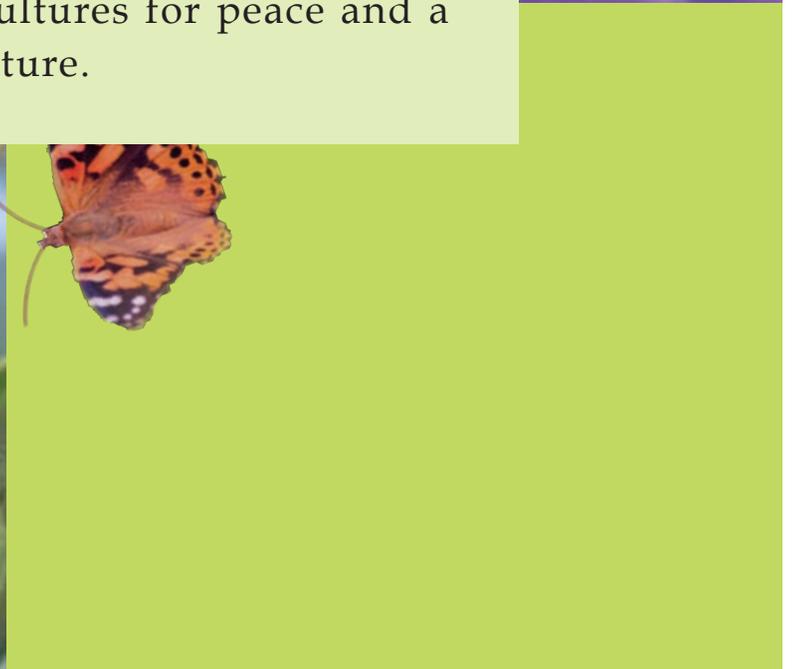
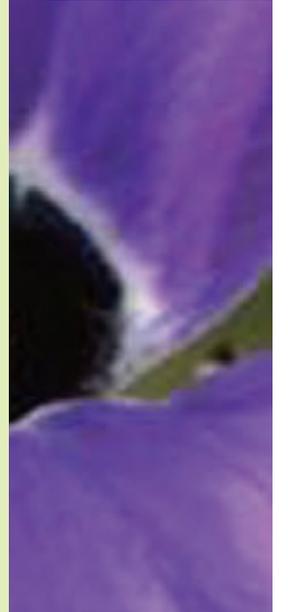
GLOBE Student Research for Sustainable Communities  
*Cape Town, South Africa*

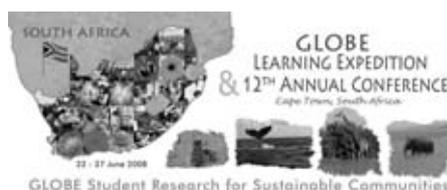
**PROGRAM**



## *W*elcome to South Africa

We heartily welcome all GLOBE students, teachers, scientists and dignitaries from South Africa and around the world to the GLE. We are very pleased that you are joining us for this week of learning, sharing, and exploring. Our belief in the value of GLOBE student research for sustainable communities will be strengthened as we come to understand how the GLOBE community is an educational and scientific force that unites people, nations and cultures for peace and a sustainable future.





## GLOBE AFRICA MANAGEMENT

Mrs. Margaret Besong  
GLOBE Program Country Coordinator, Cameroon  
GLOBE Program Regional Office

Ms. Sibongile Mokoena  
South African Environmental Observation Network  
Coordinator, Environmental Science and Outreach Education

Mr. Mark Brettenny  
GLOBE in Africa  
Environmental Resource Development and Training

## GLOBE SENIOR MANAGEMENT

Dr. Edward Geary  
Director

Dr. Emmett Wright  
Deputy Director, Education and Science

Dr. Teresa Kennedy  
Deputy Director, International Programs/Partnerships

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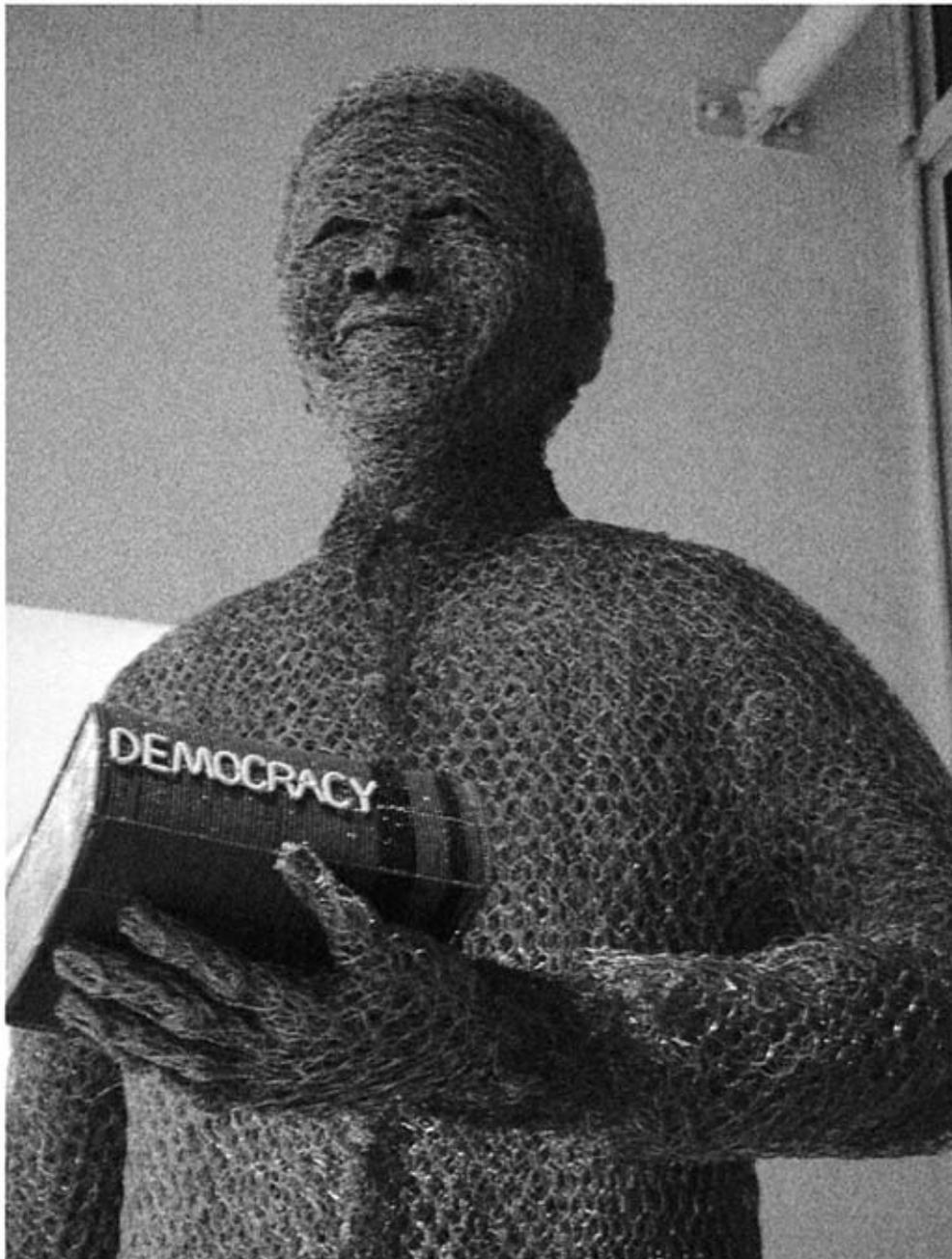
## GLOBE ORGANIZING COMMITTEE

- Dr. Emmett Wright — GLOBE Program Office, Co-Chair
- Mrs. Margaret Besong — GLOBE Africa GIAC Representative, Co-Chair
- Mr. Mark Brettenny — South Africa GLOBE, Co-Chair
- Dr. Sheila Yule — GLE Coordinator
- Dr. Peggy LeMone — GLOBE Chief Scientist

- Mrs. Rogeline Brettenny — South Africa GLOBE
- Ms. Alidjennatou Aliou Emmanuel — GLOBE Benin Country Coordinator
- Ms. Diana Garasic — GLOBE Croatia Country Coordinator GLE Host 2003
- Ms. Lynne Hehr — University of Arkansas - GLE Hostess, June 2000
- Ms. Dana Votapkova — GLOBE Czech Republic Country Coordinator
- Dr. Diola Bagayoko — Southern University and Texas A&M, USA
- Dr. Raifu Durodye — North Lake College in Texas, USA
- Tribal Meetings — South Africa Professional Conference Organizer

### GLOBE Program Office

- Ms. Silvia Agnona
- Ms. Jan Heiderer
- Mr. Martos Hoffman
- Ms. Katy Lackey
- Mr. Jamie Larsen
- Mr. Mike Leon
- Ms. Maureen Murray
- Ms. Karen Milberger
- Ms. Loretta Quinn
- Mr. Gary Randolph
- Ms. Paula Robinson
- Mr. Steve Sadler
- Mr. David Smith
- Mr. Eric Stonebraker



*Ube Nemini Emyoli*

**Happy Birthday**

Gelukkige Veryaarsdag

**PAPA MANDELA**

## 2008 GLOBE LEARNING EXPEDITION AGENDA

FRIDAY, 20 JUNE	PARTICIPANTS' ARRIVALS	LOCATION
On arrival	Dormitory check-in	Graça Machel
8:00 – 16:00	Registration & conference information desk open Travel & tours information desk open	Graça Machel

SATURDAY, 21 JUNE	PARTICIPANTS' ARRIVAL	LOCATION
6:30 – 8:30	Breakfast for dormitory residents	Graça Machel Dining Hall
8:00	Shuttles to Upper Campus (registration) begin. Schedule will be posted in Graça Machel.	See posted schedule
8:00 – 18:00	Registration & conference information desk open Travel & tours information desk open	Molly Blackburn Hall
18:00 – 20:00	Dinner	Graça Machel Dining Hall
23:00	Curfew	Graça Machel

SUNDAY, 22 JUNE	REGISTRATION – OPENING DAY	LOCATION
7:00 – 9:00	Breakfast for dormitory residents	Graça Machel Dining Hall
7:30	Shuttles begin to Upper Campus for Registration and Exhibit set-up. Return shuttles to Graça Machel will be available. Schedule will be posted.	See posted schedule
8:00 – 18:00	Registration & conference information desk open Travel & tours information desk open	Molly Blackburn Hall
8:00 – 12:00	Exhibit set-up	Leslie Hall
11:00 – 12:15	Lunch	Graça Machel Dining Hall
12:00 – 12:30	Shuttles to Upper Campus and Opening Events	See posted schedule
13:00 – 14:00	Logistics & safety briefing – all students and participants	Leslie Hall
14:00 – 15:00	Student Line-up	Alley between Leslie Hall and Jameson Hall
14:00 – 14:30	Logistics & safety briefing -- chaperones & group leaders <i>(chaperones &amp; group leaders join students in line after the briefing)</i>	Leslie Hall
14:00 – 15:00	Guests ushered to seats	Jameson Hall
15:00 – 17:30	Opening Ceremony Parade of Students	Jameson Hall



## GLOBE LEARNING EXPEDITION (GLE) OPENING CEREMONY

Convener: Dr. Emmett Wright,  
 GLOBE Program Deputy Director, Education and Science,  
 and GLOBE Learning Expedition (GLE) Co-Chair

**Greetings**

- Ms. Helen La Lime, Consul General, US Ambassador Representative
- Colonel Grant Haskins, Deputy Mayor, City of Cape Town
- Professor Anthony Staak, Vice Rector, Cape Peninsula University of Technology
- Mr. Jacob Seconna, Cape Peninsula University of Technology
- Ms. Margaret Besong, GLOBE Africa Regional Coordinator
- Ms. Sibongile Mokoena, South Africa GLOBE Country Coordinator, South African Environmental Observation Network
- Mr. Mark Brettenny, South Africa GLE Co-Chair

**Welcoming Remarks:**

- Dr. Ming-Ying Wei, Directorate for Science Missions, NASA
- Dr. Jill Karsten, Directorate for Geosciences, US National Science Foundation
- Dr. Ed Geary, Director, The GLOBE Program
- Dr. Peggy LeMone, GLOBE Chief Scientist

**GLOBE Student Keynote Address**

**Introduction:** Dr. Sheila Yule

- Ms. Achu Sandrine Ajei, Cameroon, Africa

**Introduction of Platform Guests**

*Introductions:* Dr. Emmett Wright

- Professor Maartin De Wit, University of Cape Town
- Dr. Anna-Louise Reysenbach, Portland State University

*Introductions:* Ms. Jan Heiderer

- Mr. Eugene Cussons, Jane Goodall Institute/Chimp Eden

*Introductions:* Mr. Martos Hoffman

- Ms. Hestelle Melville, Tygerberg Nature Preserve
- Mr. Bhawoodien Parker, Cape Point Global Atmosphere Watch Station
- Ms. Julie Wood, Manager, Nature Conservation
- Ms. Stacy-Anne Michaels, Edith Stevens Wetland Park
- Ms. Lindie Buirski, City of Cape Town –Environmental and Education Training Unit
- Dr. Elena Sparrow, University of Alaska at Fairbanks
- Ms. Sarah Silverberg, University of New Hampshire
- Ms. Liz Goerhing, Penn State University
- Dr. Kemi Jona, Northwestern University

*Introductions:* Mr. Mark Brettenny

- Mr. Mark Gordon, Department of Environmental Affairs and Development Planning, Western Cape Province
- Ms. Nikki Brajevich, US Embassy
- Mr. Mark Canning, US Consulate General
- Mr. Cameron Dugmore, Western Cape Education Department
- Ms. Matseliso Semilek, Western Cape Education Department
- Dr. Johann Pawl, South African Environmental Observation Network

*Introductions:* Dr. Teresa Kennedy

- Mr. Emmanuel Kambueza, World Meteorological Organization
- Mr. Emmanuel Dumisani Dlamini, World Meteorological Organization

*Introductions:* Ms. Paula Robinson

- Ms. Kate Evans – Hip2b<sup>2</sup>
- Ms. Amanda Kotze-Nhlapo, Cape Town Routes Unlimited
- Ms. Robyn Johnson, Vernier
- Mr. Andre F. Oberholzer, SAPPI

**Sunday, 22 June (continued)**

17:30 – 18:30	<b>Dignitary and Press Exhibit viewing</b> Students, sponsors and countries display their exhibit materials	Leslie Hall
<i>Student Dinner Schedule</i>		<i>Dignitary Dinner Schedule</i>
17:30 – 18:30 Shuttles to Student Dinner	18:30 Transport to Dignitary Reception and Dinner from Leslie Hall	
18:00 – 19:30 Student Dinner (Graça Machel Dining Hall)	19:00 – 21:00 Dignitary Reception and Dinner (Two Oceans Aquarium)	
18:45 – 19:30	Shuttles to Student Icebreaker	See posted schedule
20:00 – 22:00	Pre-Conference Student Icebreaker <b>Welcoming Address:</b> Ms. Simone Abramson, Hip2b <sup>2</sup>	Jameson Hall
22:00 – 22:30	Shuttles to Graça Machel	See posted schedule
23:00	Curfew	Graça Machel

<b>MONDAY, 23 JUNE</b>	<b>PLENARY EVENTS</b>	<b>LOCATION</b>
6:30 – 8:00	Breakfast for dormitory residents	Graça Machel Dining Hall
7:30 – 8:00	Shuttles to Plenary	See posted schedule
8:00 – 18:00	Travel & Tours information desk open	Molly Blackburn Hall
8:30 – 10:00	<b>Plenary Session</b> <b>Theme:</b> <i>The Role of Student Scientific Investigation in the Pursuit of Sustainable Communities</i> Convener: Dr. Peggy LeMone Introductions: GLOBE Alumni <b>Welcoming Greetings :</b> Ms. Beatrice Mulder, Cape Town Junior Mayor GLOBE Student Keynote: Mr. Samuel Naylor, Lebanon Ms. Simone Abramson, Hip2b <sup>2</sup> <b>Featured Speaker:</b> Mr. Eugene Cussons, Jane Goodall Institute/Chimp Eden	Jameson Hall
10:00 – 10:30	Walk to Leslie Hall	
10:30 – 12:00	<b>Breakout Session 1</b> 1A. Health and the Environment 1B. Water Quality and Availability 1C. Regional Impacts of Climate Change 1D. Earth System Science Project	Leslie Hall Room # LS2B Room # LS2C Room # LS2D Room # LS3B
12:00 -- 13:15	Lunch & Exhibits	Leslie Hall



**Monday, 23 June (continued)**

13:30 – 15:00	<b>Breakout Session 2</b> 2A. Health and the Environment 2B. Water Quality and Availability 2C. Regional Impacts of Climate Change 2D. Earth System Science Project	Leslie Hall Room # LS2B Room # LS2C Room # LS2D Room # LS3B
15:15 – 16:30	Cultural Presentations	Jameson Hall
16:30 – 17:00	Shuttles to dinner	See posted schedule
17:00 – 18:30	Dinner	Graça Machel Dining Hall
18:15 – 18:45	Shuttles leave Graça Machel for Cultural Presentations	See posted schedule
19:00 – 22:00	Cultural Presentations	Jameson Hall
22:00 – 22:30	Shuttles to Graça Machel (and hotel transport)	See posted schedule
23:00	Curfew	Graça Machel

<b>TUESDAY, 24 JUNE</b>	<b>PLENARY EVENTS</b>	<b>LOCATION</b>
6:30 – 8:00	Breakfast for dormitory residents	Graça Machel Dining Hall
7:30 – 8:00	Shuttles to Plenary	See posted schedule
8:00 – 18:00	Travel & Tours information desk open	Molly Blackburn Hall
8:30 – 10:00	<b>Plenary Session</b> <i>Theme: The Role of Student Scientific Investigation in the Pursuit of Sustainable Communities</i> Convener: Dr. Emmett Wright Introductions: GLOBE Alumni GLOBE Youth Speaker: Ms. Kanchanpreet Sohal <b>Sponsored speakers:</b> Mr. Alric Farmer, City of Cape Town Ms. Simone Abramson, Hip2b <sup>2</sup> <b>Featured Speaker:</b> Professor Maartin De Wit, University of Cape Town	Jameson Hall
10:00 – 10:30	Walk to Leslie Hall	
10:30 – 12:00	<b>Breakout Session 3</b> 3A. Health and the Environment 3B. Water Quality and Availability 3C. Regional Impacts of Climate Change 3D. Earth System Science Project 3E. GLOBE Partner Annual Conference	Leslie Hall Room # LS2B Room # LS2C Room # LS2D Room # LS3B Room # LS3A/ Leslie Foyer

**Tuesday, 24 June (continued)**

12:00 – 13:15	Lunch & Exhibits	Leslie Hall
13:30 – 15:00	<b>Breakout Session 4</b> 4A. Health and the Environment 4B. Water Quality and Availability 4C. Earth Systems Projects 4D. Indigenous Knowledge 4E. GLOBE Partner Annual Conference	Leslie Hall Room # LS2B Room # LS2C Room # LS2D Room # LS3B Room # LS3A/ Leslie Foyer
15:15 – 15:45	Field Day Preparation for Students	Jameson Hall
15:15 – 17:00	Take down exhibits and posters	
15:45 – 17:00	Shuttles to dinner	See posted schedule
16:30 – 18:00	Dinner	Graça Machel Dining Hall
18:00 – 18:30	Shuttles to cultural presentations	See posted schedule
19:00 – 22:00	Cultural Presentations	Jameson Hall
22:00 – 22:30	Shuttles to Graça Machel (and hotel transport)	See posted schedule
23:00	Curfew	Graça Machel

<b>WEDNESDAY, 25 JUNE</b>	<b>FIELD DAY</b>	<b>LOCATION</b>
6:30 – 7:30	Breakfast for Dormitory Residents	Graça Machel Dining Hall
8:00	Busses Depart for Field Day Group One (“Plants”): Southern Sites (Cape of Good Hope, Global Atmosphere Watch Station) Group Two (“Animals”): Northern Sites (Tygerberg Nature Reserve, Edith Stephens Wetlands Park)	
12:00 – 13:30	Lunch Group One (“Plants”): Cape Pointe Group Two (“Animals”): CPUT <i>Highlights:</i> Group One (“Plants”): Penguins Group Two (“Animals”): Local Market	
18:00	Busses Return to Graça Machel	
18:00	Shuttle to hotel	
18:45 – 19:00	Shuttles to dinner	See posted schedule
19:30 – 22:00	Alumni Hosted Event with Dinner <i>Theme: The Power of Youth</i>	Jameson Hall
22:00 – 22:30	Shuttles to Graça Machel (and hotel transport)	
23:00	Curfew	Graça Machel



<b>THURSDAY, 26 JUNE</b>	<b>FIELD DAY</b>	<b>LOCATION</b>
6:30 – 7:30	Breakfast for Dormitory Residents	Graça Machel Dining Hall
8:00	Busses Depart for Field Day Group One (“Plants”): Northern Sites (Tygerberg Nature Reserve, Edith Stephens Wetlands Park) Group Two (“Animals”): Southern Sites (Cape of Good Hope, Global Atmosphere Watch Station)	
12:00 – 13:30	Lunch Group One (“Plants”): CPUT Group Two (“Animals”): Cape Pointe <i>Highlights:</i> Group One (“Plants”): Local Market Group Two (“Animals”): Penguins	
18:00	Busses return to Graça Machel	
18:00	Shuttle to hotel	
18:45	Shuttles from hotel to dinner	See posted schedule
18:00 – 19:30	Dinner	Graça Machel Dining Hall
19:00 – 20:00	Shuttles to Cultural Presentations	See posted schedule
20:00 – 22:00	Cultural Presentations Alumni Event Wrap-Up	Jameson Hall
22:00 – 22:30	Shuttles to Graça Machel (and hotel transport)	See posted schedule
23:00	Curfew	Graça Machel

<b>FRIDAY, 27 JUNE</b>	<b>PLENARY EVENTS</b>	<b>LOCATION</b>
6:30 – 8:00	Breakfast for dormitory residents	Graça Machel Dining Hall
7:30 – 8:00	Shuttles to Plenary	See posted schedule
8:00 – 18:00	Travel & Tours information desk open	Molly Blackburn Hall
8:30 – 10:00	<b>Plenary Session</b> <b>Theme:</b> <i>GLOBE Students: Making A Difference through Student Research Campaigns</i> Convener: Dr. Sheila Yule <b>Panel:</b> Dr. Ed Geary Dr. Peggy LeMone Dr. Teresa Kennedy Dr. Emmett Wright	Jameson Hall

**Friday, 27 June (continued)**

10:00 – 12:00	Working Session: Dr. Sheila Yule <i>Supporting Student Research Campaigns through Networking and Collaborations</i> <i>A session dedicated to networking and creating collaborations between students</i>	Jameson Hall
12:00 – 13:15	Lunch	Leslie Hall
13:15 – 13:45	Walk back to Jameson Hall	
13:45 – 15:45	Closing Ceremony	Jameson Hall
<b>GLE CLOSING CEREMONY</b>		
<b>GLOBE Youth Speaker:</b> Ms. Ashley Boardwine <b>GLOBE Student Declaration</b> <b>Featured Speakers:</b> Dr. Jack Kaye, NASA Scientist Mr. Rudy Hamilton, Native Alaskan Elder <b>Student Recognitions:</b> GLOBE Student Speakers GLOBE Alumni <b>Farewell Messages:</b> Mrs. Margaret Besong Dr. Emmett Wright		
15:45 – 16:30	Shuttles to Graça Machel (and hotels)	See posted schedule
17:00 – 17:45	Busses leave for MOYO from Graça Machel	
17:30	Bus leaves for MOYO from Newlands Hotel	Newlands Hotel
18:00 – 21:00	Dinner at MOYO Convocation: Mrs. Margaret Besong Program: Students' Reflections, Music, Dance and Artistic Expression	MOYO
21:00	Busses return to Graça Machel and hotels	
23:00	Curfew	Graça Machel

<b>SATURDAY, 28 JUNE</b>	<b>PARTICIPANTS' DEPARTURES</b>	
6:30 – 9:00	Breakfast for dormitory residents	Graça Machel Dining Hall
8:00 – 18:00	Travel and Tours information desk open	Graça Machel



## Have you picked up a copy of HIP2B<sup>2</sup> magazine?

The new format (which, among other innovations, includes a pull-out centrefold) has made the smartest youth magazine on the planet even smarter. Launched by The Shuttleworth Foundation in 2002, HIP2B<sup>2</sup> aims to make maths, science and technology fascinating (and fun) to high-school learners. Why? Because Mark Shuttleworth, South African entrepreneur and the First African in Space, believes that these subjects are the launch pad to successful careers after school. And, let's face it, he should know.

The mission of HIP2B<sup>2</sup> is not to duplicate the learning that happens in the classroom, but rather to stimulate curiosity and inspire further study. Especially among Grade 8, 9 and 10 learners who have yet to choose their final subjects. So, instead of following the national curriculum, the magazine taps into youth trends and topics of interest.

Take *Smart Technology*: this section looks at the science – and the people – behind the latest accessories of the modern world (think motion-sensitive computer games and solar-powered bikinis). It's also where you'll get the lowdown on those amazing innovations that today's teens take for granted, such as post-it notes and superglue. *Deconstruction*, on the other hand, takes apart everyday objects to reveal the inner workings of an mp3 player, a poolcleaner and the washing machine, to name a few. (By the way, can you believe that most washing machines have a cement block inside them?)

Each issue of HIP2B<sup>2</sup> magazine has a central theme. The music issue explored the evolution of music technology as well as the relationship between music and maths, while the Africa issue highlighted 53 smart moments on the continent and posed the question: 'Is there an African gene in sport?' A feature on 'The Beauty of Maths' used phi to reveal the secrets of Charlize Theron's charms, and 'Is there an alien in my armpit?' explained why growing up stinks.

Naturally, each issue profiles exciting careers in science and maths-related fields as well as young achievers such as Siyabulela Xuza, South Africa's youngest rocket scientist. Sport, music, movies, books and computer games are covered too – but in a far smarter way than usual. As for the centrefold: to date it has explored our solar system, challenged readers to identify all the flags of Africa and taken a scientific look at the human body. (Did you know that the mouth houses the body's strongest muscle and the gluteus maximus, aka your butt, is its biggest one?)

Highly interactive, the publication is filled with maths problems, science experiments and *Brainbusters* – and always kicks off with a challenge on the contents page that requires analytical thinking.

HIP2B<sup>2</sup> magazine is distributed to 720 schools nationwide; by March 2009 this will increase to 1 500 schools. It's free – and each school gets around 100 copies to share among learners – but subscriptions are available too, for teachers and those who want to receive their own copy at home.

HIP2B<sup>2</sup> also has a TV show, aired on Mondays on SABC2 at 4h30. We have a mobile internet platform which can be accessed at [www.mobi.hip2b2.com](http://www.mobi.hip2b2.com), as well as an interactive website and newsletter.

For further information on HIP2B<sup>2</sup>, please visit [www.hip2b2.com](http://www.hip2b2.com). We are always looking for local and international partners to assist in reaching all learners in SA. So pop us an email on [info@hip2b2.com](mailto:info@hip2b2.com) or call us on +27 21 9701200.



## GLOBE STUDENT SPEAKERS: KEYNOTES

**Name:** Achu Sandrine Ajei

**School:** Government Bilingual Practicing High School, Yaoundé, Cameroon



**Community:** I am the second born in a family of five children. My mother is a teacher and my father works in a non-governmental enterprise. I started primary school in a school called Government School Bounda in the North West Province of Cameroon and then we moved to the Centre Province of Cameroon. I continued primary school here in Government Bilingual school Ekounou until I had my First Leaving Certificate and entered Secondary where I am presently.

**Involvement in GLOBE:** *I got involved in the GLOBE Program two years ago in Government Bilingual Practising High School Yaoundé and I am still working actively to enlarge GLOBE in my school.*

**Name:** Samuel Naylor

**School:** ACS Beirut, Lebanon



**Community:** I'm originally British, but I've made Lebanon my home and I've lived here since 1995. As a child, I would sit on top of a large atlas with the animals of the world spread across it and marvel at the splendor of planet Earth. I am still enamored with the magnificence of the natural world! My parents are both environmentalists working to preserve the country's most beautiful natural sites in a culture, in which sadly the majority of the population does not relate well to nature. As such, getting people engaged in a constructive relationship with nature is not easy and finding ways to use the natural resources of the land to the community's advantage is a solution born out of necessity.

**Involvement in GLOBE:** *Coupled with a passion for social change, my experiences have led me to place full hope in the sustainability movement, and I am certainly looking forward to the GLOBE Conference in South Africa as yet another step in my own journey with the world of environmental awareness, conservation and ultimate sustainability.*

**Name:** Kanchanpreet Sohal

**School:** Kingsburg High School, California, USA



**Community:** I was born in California but at the age of three months old, I was sent to live in India with my grandparents. From the age of 3 months to 5 years old I lived in the northern state of Punjab, India, after which I returned to live in California. I currently speak Punjabi, Hindi and English fluently.

**Involvement in GLOBE:** *We, GLOBE students, are dedicated students who are willing to go above and beyond if the opportunity presents itself. We will all play a role as leaders either as leaders in your family, leaders in your community or leaders on a state and national level. It is up to us to become stewards of the planet, to build sustainable communities, and to continue our research efforts for the betterment of education and science. Through our collective efforts we can help keep the planet lush, fertile, beautiful and green for generations to come.*

**Name:** Ashley Nicole Boardwine

**School:** St. Paul High School, Virginia, USA



**Community:** I am an American, and I have lived in the southwestern region of Virginia all my life. Because of my home's unique location, I have had the privilege of growing up in one of the world's most diverse regions. During the past four years, I have been involved with a group of students dedicated to the preservation of Wetlands Estonia.

**Involvement in GLOBE:** *I feel that the most important experience has been my participation in the GLOBE program. I have learned many skills and lessons through this program. Some of these skills include conducting accurate science experiments and communicating well with others. I will take everything I have learned through this project and put it to great use in the future. As I continue to further my education, I plan to pursue a career in the science field.*



## GLOBE STUDENT SPEAKERS: REGIONAL FINALISTS

**Name:** Nicolas Racedo

**School:** CEI San Ignacio, Argentina

**Community:** Nicolas Racedo lives in Naupahuén, a small town in the middle of the Patagonian steppe, reachable by dirt roads in poor condition. The place is arid and with little chance of development. That is why the population of Naupahuén has a subsistence economy, based on sheep and goat rearing, and lives in mud houses without running water. The rural primary school is the cultural centre of the place. The only way to study in a secondary school is with lodging facilities far from his family. The CEI San Ignacio Agricultural School is 300 km from Naupahuén, therefore Nicholas sees his family 4 times a year during school holidays.

**Involvement in GLOBE:** *Nicholas is about to finish high school and has worked actively in the GLOBE project for three years, in the protocols of soil, climate and hydrology.*



**Name:** Ada Abessolo Charlene Ryana

**School:** Government High School Mvomeka’a, Cameroon

**Community:** I am 18 years old and was born at Bimengue near Ebolowa, Capital of the South Province in the Republic of Cameroon. I haven’t lived with my mother since the age of 3, and was adopted by my aunt and uncle. I did my primary school in Public School of Afan, I have studied till form three in Mixed High School of Mvokmekka with my new family. Since Form four I have been in the Government High School of Mvomeka’a (where I live with the elder sister of my Father) for three years now.

**Involvement in GLOBE:** *Since my life is so peculiar, I wanted to be more serious in my studies and become a Diplomat. I would be able to take care of my family and my own home. Nevertheless, considering my activities with the GLOBE Program, I may do further studies in Physical Geography and become a researcher in Environmental Science which will also permit me to improve the life of my family as a whole.*



**Name:** Natasha Cerese Hope

**School:** Ramey Unit School, Puerto Rico, USA

**Community:** Natasha is the oldest of four siblings and daughter of Chief Warrant Officer Jeardon Hope who serves in the United States Coast Guard. Natasha has lived in New York, West Virginia, Kansas, Michigan and now Puerto Rico, where she is a senior at Ramey Unit School. Her primary career goal is to attend the United States Coast Guard Academy and serve as an officer in the Coast Guard.

**Involvement in GLOBE:** *One day out of the blue, my now teammate Xavier Martinez, asked me if I wanted to join the GLOBE science project after school. I said, “Sure why not?” – not really knowing the significance this project really possessed. Projects like these have not only left an impression on my team and me, but people around us who acknowledged our achievements with the GLOBE project. They have recognized how any one, in any community, can make it a better place, by giving a little bit of themselves in the process. You can be that person who decides to “pay it forward” and inspire millions to do the same, creating a safe, livable, healthy, sustainable community for all to live.*



**Name :** Lucsame Gruneck

**School :** Dara Academy, Thailand

**Community:** Chiang Mai, Thailand

**Involvement in GLOBE:** *I have been a member of GLOBE through Dara Academy, since the 5th grade and I’m currently an active member in the 12th grade. I was a team leader of hydrology protocol and nowadays, I’m a GLOBE senior of Dara Academy. When my school has a GLOBE Junior Camp, I will be an expert for younger students. I have two researches which are complete, one is The Simple Flood Hazard Mapping Model for Down Town, Chiang Mai (presented in 10th Annual GLOBE Conference at Phuket, Thailand), and the other one is The Effects of Soil Erosion to Water Quality of Three Differential Study Site: Wooden Land, The Land Development of Land Development Department, and Agriculture-Used Land of community of Maerim District, Chiang Mai, Thailand (Asia Pacific GLOBE Learning Expedition Thailand 2007)*





# GLOBE STUDENT SPEAKERS: REGIONAL FINALISTS

**Name:** Papa Ibrahima Ndiaye

**School:** High School Seydina Limamoulaye, Senegal

**Community:** Papa Ibrahima lives in the city of Dakar, Senegal. He attended Iba Der Thiam pre-school, Saint Abraham primary school, Joseph Felix Correa middle school and is currently a student at Seydina Limamoulaye high school.



**Involvement with GLOBE:** *The GLOBE program should be integrated at all levels of studies. It can lead to the creation of a national and international system for students, teachers and environment specialists who collect and exchange data. Thus they will contribute to better the teaching, the learning of sciences and the protection of environment.*

**Name:** Ibrahim Ismael Al-Amro

**School:** Al-Thawra AL-Arabia School for Boys, Jordan

**Community:** Ibrahim lives in the city of Zarka, in Jordan, where he attends 11<sup>th</sup> grade at Al-Thawra AL-Arabia School for Boys.



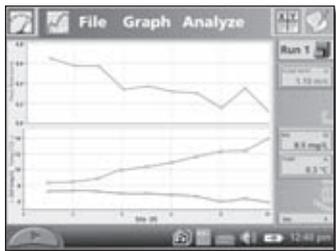
**Involvement in GLOBE:** *“By these projects, we can understand the state of our planet which is our first and last shelter. And we – the youth – are the future generation who will build the future and make the decisions about it.”*



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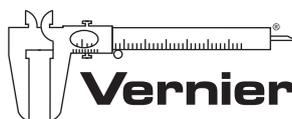
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## SPONSORED YOUTH SPEAKERS



### Beatrice (Bea) Mulder

Beatrice is 18 years old and a Grade 11 learner at Jan van Riebeeck High School in Cape Town. She has served as the Junior Mayor of Cape Town since 26 May 2007. Her extramural activities include: dancing (modern and contemporary), ballet, gymnastics, ice skating, reading, writing, movies, socializing and travel.



### Alric Leeman Farmer

Alric Leeman Farmer is an Alumnus of the University of the Western Cape. He obtained a BA degree in Environmental Science and Tourism in 2004 and a BA honours degree in Environmental Science focussing on Environmental Management and Geographical Information Systems (GIS) in 2006.

He is currently an intern at the City of Cape Town where he coordinates the YES Youth, Urban Nature and GIS programme. The YES Youth, Urban Nature and GIS programme aims to develop scholars' practical GIS skills and at the same time expose them to how environmental education officers utilize GIS to monitor the environment.

Alric's interest includes arts and crafts, photography, and embroidery and clothing design. He won the 1<sup>st</sup> place in the African Fashion Design competition at the University of the Western Cape in 2002. He is also the co-owner of Madame E Couture, a small home-based business that designs and manufactures bridal and evening wear.



### Simone Abramson

Simone has been selected as a 2008 Brand Ambassador for key GLE sponsor HIP2B<sup>2</sup>. In this role, Simone has committed to **changing the mindsets of young learners from viewing the subjects of maths and science as 'boring' and 'square' to being useful, interesting and appealing.**

Recently, Simone earned gold medals at the Beijing Youth Science Creation Competition 2008 and the Eskom 2007 Science Expo for her invention of a unique means of identifying people by photographing the back of the eye (the fundus). Simone stumbled on the idea when her grandfather had photos taken of the back of his eye to confirm a diagnosis of diabetes. Borrowing a special optometrists' camera, Simone began photographing the backs of volunteers at a local shopping mall. She collected a database of over 1,000 digital images, which she then used in her research. By creating two simple mathematical formulas Simone was able to convert each persons set of fundus measurements into a unique 10-digit identification number, creating the world's first fundus database. Simone's method, now patented, aims to replace current identification systems such as fingerprinting.

Simone's latest project looks at turning alien vegetation from a 'liability into an asset.' She is focusing on biological species that invade and alter ecological systems. Simone aims to teach how the removal of invasive species to create sellable products will create financial incentives, contribute to the eradication of invasive species, and promote a return to healthy ecosystems.



# GREETINGS FROM THE U.S. EMBASSY IN SOUTH AFRICA



**Helen La Lime**  
**Consul General**  
**Cape Town, South Africa**

From August 2006 to present, Helen La Lime has been a career member of the Senior Foreign Service, class of Minister Counselor, and is the current United States Consul General in Cape Town, South Africa. Prior to this assignment she was US Ambassador to Mozambique (2003-2006), Deputy Chief of Mission of U.S. Embassy Rabat (2001-2003) and Director of the Office of Central African Affairs (2000-2001).

Previous assignments include a tour as Deputy Chief of Mission of our Embassy in N'djamena, Chad (96-99), a year at the National War College (95-96), an assignment in the Bureau of International Organization Affairs in the Department of State (93-95), and service as Consul General in Zurich Switzerland (93). She has also held a range of consular and administrative positions at US missions in Warsaw, Bern, and Stuttgart.

Ms. La Lime joined the Foreign Service in 1980. She is a graduate of Georgetown University (BS) and of the National Defense University (MS). She speaks French, Portuguese, Spanish, German and Polish. Prior to joining the Foreign Service, Ms. La Lime worked as a teacher in France, Portugal and Holland.



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## FEATURED SPEAKER



**Eugene Cussons**  
**Rescue Director of the Jane Goodall Institute, South Africa**  
**Managing Director of Chimp Eden**

Eugene Cussons was born in Mpumalanga, a northeastern region of South Africa. For generations, the Cussons family has been deeply rooted in the African conservation ethic, and Eugene grew up with a special appreciation for African wildlife. Eugene had a successful career in the corporate world before deciding to build Chimp Eden. He studied business management and economics at the University of Pretoria, and he then developed software for financial trading applications. Deciding he didn't want to be desk bound for the rest of his career, Cussons returned to the family game reserve to combine his management skills with his love for the outdoors.

In 2006 Eugene opened Chimp Eden in collaboration with the Jane Goodall Institute (JGI). As the managing director of Chimp Eden and the rescue director of JGI South Africa, Eugene has focused Chimp Eden's efforts on rescuing chimps from areas where no one else is willing to venture, such as war-torn countries like Sudan and Angola. Personally rescuing the chimps, Eugene brings them back to Chimp Eden, where he takes on the role of caretaker.

Eugene Cussons and his wife, Natasha, have a baby girl named Haley. The family calls Chimp Eden "home" and live near the chimp sanctuary. Eugene is also a certified scuba diver, a boat skipper, skydiver and rock climber. He's an expert off-road driver and held the position of head instructor for the Land Rover Experience in South Africa.

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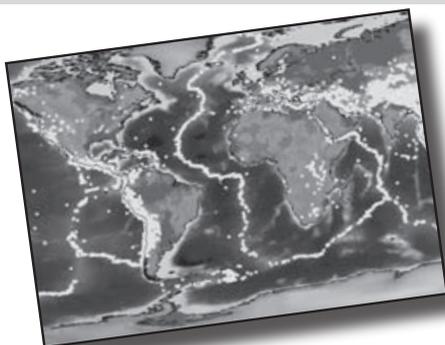
4:49:17 PM 12/05/08 XplorerGLX	
Wind Speed (m/s)	Temperature (°C)
1.2	18.7
Wind Chill (°C)	Relative Humidity (%)
14.7	52
Absolute Humidity (g/m <sup>3</sup> )	Wind Gust (m/s)
6.4	7.0
Latitude (°)	Longitude (°)
38.803375	-121.316605
Two	Four
Six	Eight



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## GUEST SPEAKERS AND SCIENTISTS



**Dr. Maarten de Wit**  
**University of Cape Town, South Africa**

Dr. Maarten de Wit, a geologist, was born and schooled in Holland, but gained his University education in Ireland at Trinity College, Dublin, and in the UK at Cambridge University where he received his doctorate after studying rock formations in Newfoundland, Canada. Thereafter a series of fellowships took him to the USA (Columbia University; LPI, Houston), South America (Univ. Chile) and South Africa (Wits University), and employment in Ethiopia with the UNDP. He has been a visiting professor at Imperial College, London, University of Utrecht (Holland), MIT (USA), and Queens University (Canada) where he was awarded an honorary doctorate in 1992. Since 1989, he is the Phillipson-Stow Professor at the University of Cape Town. His main interest is in understanding how the Earth works, particularly in its youthful stage, in inculcating robust Earth stewardship, and in redefining natural resources economics. He is the founding director of the research institute AEON (Africa Earth Observatory Network) at the University of Cape Town.



**Dr. John Hehr**  
**University of Arkansas, U.S.A.**

Dr. Hehr is the Associate Dean of the Fulbright College of Arts and Sciences at the University of Arkansas. His research interests are in the areas of meteorology and climatology and in particular severe storm occurrence over the central interior of the United States. Other interests include paeleoclimatology and global change.



## GUEST SPEAKERS AND SCIENTISTS



**Dr. Jill Karsten**  
**U.S. National Science Foundation**  
**Washington, D.C., USA**

Dr. Jill Karsten is a Program Director in the Directorate for Geosciences (GEO) of the U.S. National Science Foundation, where she oversees the \$11 million GEO Education and Diversity program. A marine geologist by training, Dr. Karsten spent 12 years on the research faculty in the School of Ocean and Earth Science and Technology at the University of Hawaii at Manoa. Her research has included studies of the volcanic and tectonic processes that occur at mid-ocean ridges in the Northeast and Southeast Pacific oceans, as well as studies on water in magmatic systems. She is author or co-author of 25 peer-reviewed publications and has participated in 16 research cruises (4 as Chief or Co-Chief Scientist). She also served for one year as a Program Officer in the Marine Geology & Geophysics program at the Office of Naval Research, followed by four years as the Education Manager at the American Geophysical Union, prior to joining NSF in November 2005. Dr. Karsten earned her B.A. degree in Geochemistry from Wellesley College (1977) and her M.S. (1980) and Ph.D. (1988) degrees in Geological Oceanography from the University of Washington.



**Dr. Jack A. Kaye**  
**U.S. National Aeronautics and Space Administration (NASA)**  
**Washington, D.C., U.S.A.**

Dr. Jack Kaye currently serves as Associate Director for Research of the Earth Science Division within NASA's Science Mission Directorate. He has been a member of the Senior Executive Service since August, 1999, managing NASA's Earth Science Research Program. Earlier positions in his nearly 24 year career at NASA include being a Space Scientist at the Goddard Space Flight Center and Manager of the Atmospheric Chemistry Modeling and Analysis Program at NASA HQ. His academic training is in chemistry (B.S. Adelphi University, 1976; Ph.D., California Institute of Technology, 1982). As Associate Director for Research, Dr. Kaye is responsible for the research and data analysis programs for Earth System Science, covering the broad spectrum of scientific disciplines that constitute it. He represents NASA in many inter-agency and international activities and has been an active participant in the US Climate Change Science Program (CCSP) in which he currently serves as NASA principal and Vice Chair of the Subcommittee on Global Change Research, as well as NASA's representative to the Senior Users' Advisory Group for the National Polar Orbiting Operational Environmental Satellite System and to the Joint Subcommittee on Ocean Science and Technology. Dr. Kaye is a member of the Steering Committee for the Global Climate Observing System. He has received numerous NASA awards, and has been recognized as a Meritorious Executive in the Senior Executive Service in 2004. He was elected to serve as co-secretary of the Atmospheric Sciences Section of the American Geophysical Union (AGU) for 1998-2000. The AGU has recognized him on two occasions with a Citation for Excellence in Refereeing. He has published more than 50 refereed papers, contributed to numerous reports, books, and encyclopedias, and edited the book *Isotope Effects in Gas-Phase Chemistry* for the American Chemical Society.



## GUEST SCIENTISTS AND SPEAKERS



**Dr. Peggy LeMone**  
**National Center for Atmospheric Research**  
**Boulder, Colorado U.S.A.**

Dr. Peggy LeMone is GLOBE’s Chief Scientist. Born and raised in Columbia, Missouri, USA, Dr. LeMone spent much of her childhood exploring the woods near her home, picking up interesting rocks and fossils. She attributes the start of her interest in weather to the night when lightning struck her family’s home while they were eating dinner. Dr. LeMone, or Peggy as she was known then (and still prefers to be called), was about 9 years old at the time. The roof exploded into tiny pieces, caught fire, and sent smoke and debris down the chimney and into the house. Fortunately the hard rain put out the fire even before the Fire Department arrived. The next day it was “show and tell” at school and Peggy had a lot to tell. This was her first talk on weather. In the next few years, she started observing the weather and keeping records. Peggy’s older brother Charlie built radios and stereo sets in his bedroom. Between learning from Charlie and watching the weather, Peggy knew she wanted to become a scientist. At the University of Missouri, Peggy studied math, physics and all the atmospheric sciences courses that were offered. She did her Ph.D. at the University of Washington. Taking measurements on the ground, using aircraft and satellites too, she has studied what causes cloud streets (cumulus clouds that line up with the wind), squall lines, hurricanes, and how the earth’s surface heats and moistens the atmosphere. “I go where the weather is,” writes Peggy. “I studied squall lines in the tropical Atlantic and Pacific Oceans, flew through hurricanes in the northeast Pacific, studied the interaction of Taiwan with squall lines, and looked at how the atmosphere behaves in fair weather in all these places, plus the central United States.” Dr. Peggy LeMone is also keenly interested in Education. She became GLOBE’s Chief Scientist because at GLOBE she can tie together everything she enjoys most: studying weather and climate change, writing books and blogs, and most of all working with students.



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## GUEST SCIENTISTS AND SPEAKERS



Photo by Frans Lanting.

**Dr. Anna-Louise Reysenbach**  
**Portland State University**  
**Portland, OR., USA**

Dr. Anna-Louise Reysenbach is a microbial ecologist who grew up in South Africa and did her PhD at the University of Cape Town. During this time she was an avid windsurfer and scuba diver and decided to follow her passion for science and aquatic sports by focusing her research on microbes from high temperature environments. Her work has taken her to most of the terrestrial and deep-sea vent hydrothermal systems in the world, including the discovery of new deep-sea vents in the southern Pacific and Indian Oceans. She has used the research submersibles *Alvin* (US), *Nautilie* (France) and *Shinkai 6500* (Japan), and her current deep-sea research relies heavily on remotely operated vehicles such as *Jason II* and the *Tiburon*. Her lab combines classical culturing techniques with genomic approaches to explore the diversity and role thermophiles (heat loving microbes) play in terrestrial and deep-sea hydrothermal systems. Recently, she isolated the first true thermoacidophile (heat and acid loving microbe) from deep-sea vents, which represents a new branch in the *Archaea*.

She has published widely, including *Nature* and *Science*. Her research is funded primarily by the US National Science Foundation (NSF) and NASA. Reysenbach has served on many scientific committees and the editorial boards of several scientific journals including *Geobiology*. In addition to her professional activities, Dr Reysenbach has been involved in numerous outreach and educational endeavors. In Yellowstone each summer, she teaches a popular 4-day course to the public on Yellowstone's microbes. She has been involved in numerous documentaries that include the Discovery Channel, US Public Broadcasting Station (PBS), NOVA, National Geographic and the BBC. Dr. Reysenbach's home page: <http://alrllab.pdx.edu/>



**Dr. Ming-Ying Wei**  
**U.S. National Aeronautics and Space Administration (NASA)**  
**Washington, D.C., USA**

Dr. Ming-Ying Wei currently serves as the Program Manager for Earth Science Education and Outreach within NASA's Science Mission Directorate. She joined NASA in 1990 when NASA launched the Earth Observing System (EOS) Program which has since provided new environmental measurements from space and brought new insights into the connections between Earth's air, water, land, and life. Dr. Wei grew up in Taiwan and came to the U.S.A. in 1973 to pursue advanced degrees in meteorology (M.S. and Ph.D., University of Oklahoma, 1979). She enjoys outdoor sports and believes in the value of the outdoor environment for us to learn, explore, and discover.



# STUDENT RESEARCH SEMINAR

Monday 23 June, 10: 30 – 12:00

A. Health and the Environment	B. Water Quality and Availability
<p><b>Room #LS2B, Leslie Hall</b>  <b>Moderator:</b> Mrs. Rogeline Brettenny  <b>Guest Scientist:</b> Dr. Peggy LeMone</p> <p><b>Calisph'air</b>  <b>About Pollution and Asthma</b>            College La Chenaie, Mouans Sartoux, France</p> <p><b>The Ozone Exposure in and around our School as well as its Effect on Airway Diseases</b>            Goethe Schule, Wetzlar, Germany</p> <p><b>Influence of Traffic on Air Quality</b>            College de Heemlanden, Houten, The Netherlands</p>	<p><b>Room # LS2C, Leslie Hall</b>  <b>Moderator:</b> Dr. Diola Bagayoko  <b>Guest Scientist:</b> Dr. Anna-Louise Reysenbach</p> <p><b>Quality of Water of a Stream in Pujato's Rural Zone</b>            Escuela de Ensenanza media N°241, Pujato, Argentina</p> <p><b>The Relationship between Soil Water Storage and Altitude</b>            Government Bilingual Practicing High School, Yaoundé, Cameroon</p> <p><b>The Supply and Quality of Drinkable Water in Mvomeka'a</b>            Government Bilingual Practicing High School, Yaoundé, Cameroon</p>
C. Regional Impacts of Climate Change	D. Earth System Science Projects
<p><b>Room # LS2D, Leslie Hall</b>  <b>Moderator:</b> Ms. Alidjennatou Aliou Emmanuel  <b>Guest Scientist:</b> Dr. Ed Geary</p> <p><b>The Effect of Climatic Change in the Flows of the River Chimehuin, Malleo and Quilquihue and Their Relations with the Humidity of the Steppe and Mallin Land</b>            C.E.I. San Ignacio, Argentina</p> <p><b>Effects of Climate Change on Water Quality of the Chimehuin River, Junin do los Andes Patagonia, Argentina</b>            C.E.I. San Ignacio, Argentina</p> <p><b>The Role of CO<sub>2</sub> in Global Warming</b>            College Cantelande, Cestas, France</p>	<p><b>Room # LS3B, Leslie Hall</b>  <b>Moderator:</b> Mr. Gary Randolph  <b>Guest Scientist:</b> Dr. Elena Sparrow</p> <p><b>Phenology Research: Trees Green-Up in Iisalmi</b>            Juahni Aho's School, Iisalmi, Finland</p> <p><b>Forest-fire danger in forest areas of Tallinn</b>            Tallinna Science Secondary School, Estonia</p> <p><b>The Effect of Leaf Mulch on Soil Moisture and Soil Temperature in the Tropics</b>            Ramey School, Ramey, Puerto Rico, USA</p>



**Monday 23 June, 13:30 – 15:00**

<b>A. Health and the Environment</b>	<b>B. Water Quality and Availability</b>
<p><b>Room #LS2B, Leslie Hall</b>  <b>Moderator:</b> Dr. Kemi Jona  <b>Guest Scientist:</b> Dr. Peggy LeMone</p> <p><b>Environment and Health in and around Maastricht, Netherlands</b>            Sint-Maartenscollege, Maastricht, The Netherlands</p> <p><b>Effects of Mercury Contaminated Food on Growth of Mice <i>Mus Musculus</i></b>            Kibaha Secondary School, Kibaha, Tanzania</p> <p><b>Troposphere Ozone Levels and Respiratory Health of Students at Kingsburg High School</b>            Kingsburg High School, Kingsburg, CA, USA</p>	<p><b>Room # LS2C, Leslie Hall</b>  <b>Moderator:</b> Ms. Sarah Silverberg  <b>Guest Scientist:</b> Dr. Ed Geary</p> <p><b>Death-rate of Fish in the River Kupa</b>            OS Banija, Karlovac, Croatia</p> <p><b>What Water do We Drink?</b>            OS Konjscina, Konjscina, Croatia</p> <p><b>The Guadarrama River in Central Spain: Environmental Research on Water Quality</b>            IES Federico Garcia Lorca, Las Rozas de Madrid, Spain</p>
<b>C. Regional Impacts of Climate Change</b>	<b>D. Earth System Science Projects</b>
<p><b>Room # LS2D, Leslie Hall</b>  <b>Moderator:</b> Ms. Liz Goehring  <b>Guest Scientist:</b> Dr. Anna-Louise Reysenbach</p> <p><b>The Climate Changes in Rujiena</b>            Rujiena Secondary School, Rujiena, Latvia</p> <p><b>Climate Parameters Influence on Mosquito Larvae Development</b>            Lycee Laurent Botokeky, Toliara, Madagascar</p> <p><b>The Future of Coastal Cod in the Region of Salten in Northern Norway under Influence of Global Warming and Persistent Organic Pollution</b>            Bodø Videregående Skole, Bodø, Norway</p>	<p><b>Room # LS3B, Leslie Hall</b>  <b>Moderator:</b> Mr. Gary Randolph  <b>Guest Scientist:</b> Dr. Elena Sparrow</p> <p><b>This Is Why I'm Hot</b>            Roswell Kent Middle School, Akron, OH, USA</p> <p><b>New Green In Pujato</b>            Club de Ciencias N° 076 "Julio Maiztegui" del Colegio N° 1345, Pujato, Argentina</p> <p><b>WATER Along the Clinch River using GLOBE</b>            St. Paul High School, VA, USA</p>

**Tuesday 24 June, 10:30 – 12:00**

<b>A. Health and the Environment</b>	<b>B. Water Quality and Availability</b>
<p><b>Room #LS2B, Leslie Hall</b>  <b>Moderator:</b> Mr. Jamie Larsen  <b>Guest Scientist:</b> Dr. Rusty Low</p> <p><b>Climate and its Effect on West Nile Virus Distribution and Prevention</b>  Center School District #58, KS, USA</p> <p><b>The Influence of Atmospheric Condition on the Prevalence of Endemic Malaria in Bamunka-Ndop Central Sub-Division of the North-West Province of Cameroon</b>  GBHS Ndop, Bamenda, Cameroon</p> <p><b>Magic Dust</b>  Notre Dame School, Santo Domingo, Dominican Republic</p>	<p><b>Room # LS2C, Leslie Hall</b>  <b>Moderator:</b> Mr. Martos Hoffman  <b>Guest Scientist:</b> Dr. Maartin De Wit</p> <p><b>Domestic Water Quality Status at Kibaha Town</b>  Mailimoja and Kibaha Secondary School, Tanzania</p> <p><b>The Effect of Soil Erosion on Water Quality of Three Different Study Sites</b>  Dara Academy, Chiang Mai, Thailand</p> <p><b>Assessment of the Purity Class of the Wislok River Poland</b>  Gimnazjum No 9, Rzeszow, Poland</p>
<b>C. Regional Impacts of Climate Change</b>	<b>D. Earth System Science Projects</b>
<p><b>Room # LS2D, Leslie Hall</b>  <b>Moderator:</b> Mr. David Smith  <b>Guest Scientist:</b> Dr. John Hehr</p> <p><b>Is It Possible to Observe Local Climate Change at Vang in Norway?</b>  Vang Barne- og Ungdomsskule, Vang i Valdres, Norway</p> <p><b>Effects of the Climatic Change in the Frequency and Duration of the Fires in North Patagonia</b>  C.E.I San Ignacio, Argentina</p> <p><b>SAT-HYDRO: Study of a Watershed Using Satellite Data in the Champagne-Ardenne Region North-East France</b>  Lycee Roosevelt, Reims, France</p>	<p><b>Room # LS3B, Leslie Hall</b>  <b>Moderator:</b> Mr. Gary Randolph  <b>Guest Scientist:</b> Ms. Hestelle Melville</p> <p><b>The Springs</b>  Gymnazium Dr. A. Hrdlicky, Humpolec, Czech Republic</p> <p><b>Tendencies of Changes of Temperatures</b>  Complex of Secondary Schools, Przysucha, Poland</p> <p><b>Structural Changes in our Local Stream to Improve Biodiversity</b>  ICS Franzisches Feld, Braunschweig, Germany</p>



**Tuesday 24 June, 13:30 – 15:00**

<b>A. Health and the Environment</b>	<b>B. Water Quality and Availability</b>
<p><b>Room #LS2B, Leslie Hall</b>  <b>Moderator:</b> Ms. Liz Goerhing  <b>Guest Scientist:</b> Dr. John Hehr</p> <p><b>Drinkable Water and its Influence on People's Health</b>            Zelyonoborskaya School Gymnasium, Zelyony Bor, Kazakhstan</p> <p><b>The Health Effects of Mineral Concentrations in Potable Water</b>            Zelyonoborskaya School Gymnasium, Zelyony Bor, Kazakhstan</p> <p><b>Rainfall pH in Different of Land Uses at Bangkok of Thailand</b>            Roong Aroon School, Bangkok, Thailand</p>	<p><b>Room # LS2C, Leslie Hall</b>  <b>Moderator:</b> Mr. Martos Hoffman  <b>Guest Scientist:</b> Dr. Maartin De Wit</p> <p><b>Study of Thermal Spring Waters at Ankara Administrative Province.</b>            TED Polatli Koleji Secondary School, Polatli/Ankara, Turkey</p> <p><b>Did Either the Fish Weir or the Controlled Burn Effect the Health of our River?</b>            Pin Elementary/Junior High School, ID, USA</p> <p><b>Save Our Ponds</b>            Srednja Skola Mate Blazine, Labin, Croatia</p>
<b>C. Earth System Science Projects</b>	<b>D. Indigenous Knowledge</b>
<p><b>Room # LS2D, Leslie Hall</b>  <b>Moderator:</b> Ms. Sarah Silverberg  <b>Guest Scientist:</b> Professor Anthony Staak</p> <p><b>A Comparison of Green Up in Two Locations at Similar Latitudes: Indiana and Washington, DC</b>            Indiana School For the Deaf, Indianapolis, IN, and Model Secondary School for the Deaf, Washington, DC, USA</p> <p><b>Water Never Runs Astray</b>            Bergen Katedralskole, Norway</p> <p><b>The Influence of the Water on the Physical-Chemical Features of the River Sava</b>            OS Hugo Badalic, Slavonski Brod, Croatia</p>	<p><b>Room # LS3B, Leslie Hall</b>  <b>Moderator:</b> Mr. Jamie Larsen  <b>Guest Scientist:</b> Dr. Ed Geary</p> <p><b>Integrating Indigenous Athabaskan Deg Hitan Knowledge and GLOBE Measurements in an Alaskan Boreal Forest Study</b>            Innoko River Traditional High School, Alaska, USA</p> <p><b>Adopt a River Project: A combined effort of the schools in the George Region in collaboration with the Eden District Municipality</b>            Hibernia Primêr, Heidedal Primêr, Delville Park Primêr, Rosemoor Primêr, South Africa</p> <p><b>Medicinal Plants</b>            Indwe Secondary School, Mossel Bay South Africa</p>



# ABSTRACTS: GLOBE STUDENT RESEARCH REPORTS

## ARGENTINA

**School:** Centro de Educación Integral “San Ignacio”

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** The effects of climatic change in the flows of the rivers Chimehuín, Malleo and Quilquihue and their relationship with the humidity of the steppe and “mallín” (wetland) land

**Abstract:** The water is a scarce resource especially in summer in the steppe Patagonian when most of the fires occur. Its use is increased by the population’s increase and it will continue with future urbanizations.

Significant differences were detected in meteorological variables and in the flows coinciding with the hottest years at global level. Humidity of the steppe soil is related to local meteorological variables, while humidity of “mal-lines” is related to the river flow. If precipitations and flows diminish land erosion will increase.

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**School:** Centro de Educación Integral “San Ignacio”

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** Effects of the climatic change in the frequency and duration of the fires in the North of the Patagonia

**Abstract:** Considering the impacts of the climatic change added to the anthropic effects we ask ourselves: How are we being affected at a regional scale by global changes respecting the frequency of fires? Has the frequency and duration of the fires changed? How do the changes of the meteorological variables influence the meteorological index of danger of fires (FWI)?

Hypothesis<sub>1</sub>: The temperatures, thermal amplitude, humidity, rains and followed days without rains in the last years in Junín of the Andes, don’t coincide with the hottest years to global scale, neither with the events of the “El Niño” and “La Niña.”

Hypothesis<sub>2</sub>: The frequency and the duration of the fires have not changed in the last years.

Hypothesis<sub>3</sub>: The FWI indicates the changes in the meteorological variables that can cause a fire.

Hypothesis<sub>4</sub>: The fire season of has not changed in the last years.

Atmosphere measurements were carried out using the GLOBE protocol. So as to detect evidences of climatic change, meteorological data (provided by governmental organisms) were used relating them with NOAA and NASA data on global changes. Significant differences were detected in the meteorological variables and in the frequency of fires during the season which expanded until April inclusive, coinciding with the hottest years at global level. The month of October of 1998 has very significant differences with all the other ones, coinciding with the events “El Niño” and “La Niña” in the same year; as well as being one of the hottest years to global level.

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**School:** Centro de Educación Integral “San Ignacio”

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** Effects of climate change on water quality Chimehuín River. Junín de los Andes, Patagonia, Argentina.

**Abstract:** The water of the river Chimehuín is used by people for human consumption, watering, recreation and sport fishing. Its use is increased by the population’s rising and it will increase with the future urbanizations on its coasts.

Considering the impacts of the climatic change added to the anthropic effects we wonder about: where do we go to with the quality and quantity of water in our area? How is it affecting us at regional scale the changes at global level?

Hypothesis<sub>1</sub>: The temperatures, thermal amplitude, humidity, rains and followed days without rains in the last years in Junín of the Andes don’t coincide with the hottest years to global scale.

Hypothesis<sub>2</sub>: The flows of the river Chimehuín are the same in the last years and they are not affected by the hottest years to global scale.



Hypothesis<sub>3</sub>: The quality of the water doesn't change with the fluctuations of the flow of the river Chimehuín and in the watering channel.

Hypothesis<sub>4</sub>: The quality of the water of the river Chimehuín has not changed in the last years.

Weekly measurements of quality of water were carried out from 2001 to 2007, using protocols GLOBE, showing: a) river b) a watering channel. To detect evidences of climatic change, meteorological data and flow of the river Chimehuín data (provided by government organisms) were used relating them with the NOAA data of the phenomenon ENSO and those of NASA of the hottest years at global level.

Significant differences were detected by means of the test Tukey(HDS) in the meteorological variables, in the flow and in the quality of the water coinciding with the hottest years at global level. If the flow of the river continued its tendency to get lower, the quality of the water would get lower resembling of the watering channel.

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**School:** Club de Ciencias N° 076 "Julio Maiztegui" del Colegio N° 1345 de Pujato, Santa Fe Province

*Monday 23 June, 13:30-15:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** New Green In Pujato

**Abstract:** This work was carried out from the Science Club N°. 076 "Julio Maiztegui" (School No. 1345) of Pujato-Santa Fe. This project seeks to respond to a local need: the reforestation of the town to benefit the local environment.

Most people are engaged in activities related to agriculture (cultivation, collection and transportation of grain). As a result of these activities, a variety of herbicides and pesticides are applied in plots located a few meters from the urban area; also felling of forests that formerly existed, to take place to cultivate soya (monoculture soya) or to increase urban fabric.

Moreover the low wooded public as well as their pruning indiscriminate could produce that Pujato turn in the near future, in a "heat island".

All these aspects affect the local environment and quality of life for its inhabitants.

The aims from this project are study different species of trees, woody species and existent species with the phenology protocols.

To prevent the effect of island of heat the students intend to reforest areas of Pujato with the local government's collaboration and the Association "Friends of the Tree".

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**School:** Club de Ciencias N° 136 "Houssay" del Colegio N° 241 de Pujato, Santa Fe Province

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall*

**Title:** "Water that you haven't to drink..." – Quality of the water of a stream in Pujato's rural zone (Santa Fe-Argentina)

**Abstract:** Quality of the water of a stream in Pujato's rural zone (Santa Fe-Argentina). Students of the Club of Sciences N° 136 "Houssay" (School N°241) of Pujato, of 9° year have determined, in May and June 2007, the quality of the waters of a stream that born in the locality, it is tributary of the Ludueña stream which flows into the Parana river, in Rosario.

The students in the field: 1) observed the stream and the area around it. 2)examined the flora and the crops, 3) collected samples of flora and identified species, 4) drew sketches of the stream and its insertion in the Basin Ludena, 5) determined position with GPS, 6) measured width, depth and water temperature, 7) noted transparency, smell and appearance of water, 8) collected samples of water several days to determine pH, dissolved oxygen, presence of dissolved salts by conductivity.

Students observed, from the first sampled of water, a significant decrease in dissolved oxygen and the last sampled of water registered a high level of alkalinity, indicating that are altered environmental conditions. They determined that the salt content is very low and they did not find presence of nitrates. An analysis showed that the bacteriological results are within the limits required for the provision of drinking water standards in the province of Santa Fe. In conclusion they can comment about the physical and chemical conditions, in moments studied, show a slight impact, temporary and recoverable of human action. This study in the headwaters of a tributary of Ludueña stream stands as an important point of a preventive nature aimed at preventing future environmental conflicts.



### BAHRAIN

**School:** Shaikh Abdul Aziz Bin Mohammed Al Khalifa Boys Secondary School

**Title:** The Economical Importance

**Abstract:** In this research, we are to give some of the basic in information about a specific kind of fish, inhabiting the territorial waters and the importance of the fish to the sustainability of our community.



### CAMEROON

**School:** GBHS Ndop, Bamenda, North West province

**Title:** The influence of atmospheric conditions on the prevalence of endemic malaria in Bamunka-Ndop central sub-division of the north-west province of Cameroon.

**Abstract:** The project titled, “The Influence of Atmospheric Conditions on the Prevalence of Endemic Malaria in Bamunka-Ndop Central Subdivision of the Northwest Province of Cameroon” investigates the relationship that exists between the prevalence of malaria and rainfall, temperature & humidity variations in Bamunka. GLOBE Student atmospheric data for GBHS Ndop, (Located in Bamunka) from January to December 2005 was downloaded from the GLOBE website. The Excel spreadsheet was then used to calculate the averages for each month, for current temperature in degrees Celsius, relative humidity in percentage, and rainfall in millimeters. These averages for each atmospheric parameter per month were then correlated with hospital data from the Ndop district hospital, for the same period, on graphs.

From the results obtained, it can be concluded that, malaria is endemic in Bamunka, and that temperature, rainfall and humidity, greatly influence its prevalence. The months of March, May and October provide the most optimum conditions for the transmission of malaria while April, June and September, provide the most unfavourable conditions for transmission. This information can be used in the planning and implementation of malaria control activities in the Ndop health District.



*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*

TRONHA | 14572



**Sustainability isn't just about getting involved. It's also about staying involved.**

Sappi is no newcomer to sustainable development. Working with leading environmental organisations such as WWF and BirdLife SA, we continue to actively support several long-standing sustainability initiatives. Through the SappiWWF TreeRoutes Partnership we have taken major birding routes and projects in KwaZulu-Natal under our wing. We create jobs for local communities through innovative birding and eco-tourism programmes. We are involved in conserving valuable natural areas on our forest lands and protecting the endangered species that live there. Our efforts have earned us the Gold Panda and the Gifts to the Earth awards from WWF. Acknowledgements that have spurred our efforts to protect our planet and promote the prosperity of its people.

**sappi**

[www.sappi.com](http://www.sappi.com)



**School:** Government Bilingual Practicing High School, Yaounde

**Title:** The relationship between soil water storage, and altitude

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall*

**Abstract:** Ndop – Cameroon is located on latitude: 6.1008 N and altitude 1302m, while Adjohoun – Benin is located on latitude: 6.4180 N and altitude 37m (GLOBE Program student GPS readings). Found on almost the same latitude, these two GLOBE study sites are expected to have similar climate regimes. Despite the vast difference in elevation, literature review shows that the two sites have a similar soil type – loamy sand. This project sets out to investigate the relationship between soil water storage, and altitude by making use of daily precipitations (rainfall) and temperature figures collect over a given period of time. With these values, monthly Potential Evapotranspiration values were calculated and the water balance tables for the two sites completed. Graphs of total monthly precipitations, water storage and actual evapotranspiration were drawn using the Excel Program for visualisation and the identification of trends and patterns, needed for comparison of the soil water retaining capacities of the two sites. From the results obtained, it was found that altitude influences soil water storage capacity probably indirectly through its moderating effect on temperature and rainfall. The work further illustrated the classroom and the real life importance of modelling the water budget of an area, especially for poor and developing countries such as Cameroon and Benin.

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**School:** Government Bilingual Practicing High School, Yaounde

**Title:** The supply and quality of drinkable water in Mvomeka’a.

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall*

**Abstract:** The study aimed at investigating the quality of water consumed by the Mvomeka’a Population. Simple hydrology GLOBE protocols (the temperature, turbidity, and pH) were used. We took the data for six weeks from four sites (water from a modern well, a river, pipe-borne supplied by the National Water Corporation (Société Nationale des Eaux du Cameroun (SNEC)) and water from a traditional well). These sites are the most used sources of consumable water in Mvomeka’a. From our analyses, from the modern well is of better for a direct consumption in Mvomeka’a than all the other sources. The PH is neutral on the average and the turbidity is high (up to 110 cm) for the six weeks of studies. Since water from SNEC is directly consumed we have suggested that it should be properly treated before use. We have also suggested that many more modern wells be constructed since those that exist are not sufficient to meet the needs of the entire population of Mvomeka’a.

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**CROATIA**

**School:** OS Banija, Karlovac

**Title:** Death-rate of fish in the river Kupa

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**Abstract:** The aim of our research is to discover why fish die during summer in the river Kupa in Karlovac? Our hypothesis is : Dying of fish is due to high temperature, little oxygen, low water level and industrial pollution. We also suppose that some sort of invertebrate animals indicating pollution could be found in the river. We took the samples of macro invertebrate from the bottom of the river, examined by the microscope, classified them according to their tolerance to pollution and calculated their biotic index.

The analysis of the results show that the temperature of the water of the river Kupa was rising in August 2003 and August 2006 up to 27°C. The quantity of dissolved oxygen was low: 4 mg/l. During the period of dying of fish we noticed nitrates and nitrites that could be the result of industrial pollution. Level of the water was low: 80cm below the normal level.

We classified invertebrate into three categories: those indicating pollution, those indicating clean water and those tolerant to both and living in all waters.

We calculated the biotic index that was 5.0 (on 24th Sept. 2006) and 4.8 (on 9th May 2007) and both are the characteristic of medium clean waters.

We concluded that dying of fish was the result of high water temperature, little oxygen, low water level and industrial pollution.

The quality of the water in Kupa and the degree of pollution should be regularly monitored because of its importance for the health of the population.

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*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2D, Leslie Hall*

**School:** OS Hugo Badalic, Slavonski Brod

**Title:** The influence of the water on the physical – chemical features of the river Sava

**Abstract:** Slavonski Brod is situated on the north bank of the river Sava, on the south edge of the Pannonian plain, between Brodsko Brdo ( the shapes of mountain Dilj) and the river Sava. The river Sava is one of three longest rivers in Croatia ( the lenght is 940 km) and the surface of its basin is 95729 km<sup>2</sup>.

We checked the physical – chemical features of the river Sava ( temperature, pH, transparency, alkalinity, nitrate, nitrite, dissolved oxygen) by GLOBE protocols once a week for 6 years.

We asked ourselves if the water level had an influence on physical.- chemical features of the river Sava. Namely, the water level of the river Sava changes during the whole year so the difference between the lowest and the highest water level is up to 10 meters. We assumed that water level had an influence on some physical – chemical features of the river Sava.

For the research we needed date, water temperature, pH, transparency, dissolved oxygen, nitrate, nitrite, alkalinity and water level. Besides the results of our measurements of those physical – chemical features of the river Sava by GLOBE protocols in the period from 2003 to 2007. We asked the water level date for the same period of time from the State Meteorological and Hydrological Service.

We represented the date by graphs showing the relation between the water level and the physical – chemical features of the river Sava ( temperature, pH, transparency, alkalinity, dissolved oxygen, nitrite, nitrate.)

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**School:** OS Konjscina, Konjscina

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**Title:**What water do we drink?

**Abstract:** The idea for the project has crossed our minds while making preparations for the Project Day of our school pertaining to the World Day of Water. Our plan has been to examine the sanitary quality of water having been drunk by the inhabitants of our municipality. We have assumed that the water from the Public Waterworks System is sanitary clean, and that the inhabitants drinking water from the public wells is sanitary unclean. We have selected seven exploratory spots for making our tests. Five of these research spots have been the public and private wells not being linked to the Public Waterworks System. We have also picked two research spots at the wellspring of the Public Waterworks System itself and the water from the faucet in our school.

Utilizing the Globe protocols we have examined the physical and chemical properties of the tested water. We have compared our results with the results made by the Health Department of Ecology. We have worked closely together with that Department during the whole project. The results of our examinations have not showed considerable flections from the maximum allowable concentration except in the case of public wells in the Jertovec community. We have also used the results of the Health Department of Ecology because their microbiology results and our physical and chemical water property results have made the right confirmation of sanitary cleanness of water. We have come to these conclusions:

- The analysis of the water samples from public and private wells have proven that water from these locations is unclean for drinking. Though, the water could be used for cooking, except in the case of the public wells in the Jertovec community, where the analysis have showed that water from that wells need not to be used neither for drinking nor for cooking.
- The analysis of the water samples originating from both the spot at the wellspring of the Public Waterworks System itself and the water from the faucet in out school has proven that water is sanitary clean thus confirming our assumptions to be true.

We have notified the Municipality of Konjscina and the users of water from the tested wells about our test results in written form and the public in general through the means of mass communication. Utilizing the GLOBE protocols just confirmed the usefulness of the GLOBE program for both the students themselves and the local community. The students have managed to link and apply the acquired knowledge from various school subjects as well.

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**School:** Srednja skola Mate Blazine Labin

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**Title:** Save our ponds



**Abstract:** Eight years ago, 43 globe students had defined the coordinate for 41 ponds using gps method and had drown them into the map of labin area. This year our GLOBE group in project “Save Our Ponds” tried to find answer on the research question:

Are the karstic ponds of Labin endangered ecosystems? We did a pond search as well as a biodiversity study of each pond. Our findings will be integrated into a plan to protect the biodiversity of our ponds.

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**CZECH REPUBLIC**

**School:** Gymnazium Dr. A. Hrdlicky, Humpolec

**Title:** The Springs

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

**Abstract:** Our project is a continuance of our predecessor’s work from the years 2002–2005. It dealt with the mapping of water sources in the surroundings of Humpolec. The town of Humpolec is stocked by fresh water from two sources. The first is the water reservoir on river Zelivka, the second source is water from springs near the town. All water resourses were searched and mapped in the years 2002–2005. The size of the explored area was approximately 2 km around Humpolec. Selected sources were chemically analyzed and their flow rate was monitored. The results were put into the tables. Only paper forms of the maps existed and it was necessary to create digital forms. In 2007 and 2008 the verification of all found water sources was made and it was compared to the previous results. Data were digitized to the following form by GIS (Geographic Information System):

- Every water source is accurately trasmitted in an electronic map.
- Every water source has its own table which contains data about its sort, size, water yield, position, etc.
- Information can be modified
- In the future, information will be extended

The results of our project will be used by the town of Humpolec and the region of Vysocina.

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**DOMINICAN REPUBLIC**

**School:** Notre Dame School of Santo Domingo

**Title:** Magic Dust

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*

**Abstract:** Our project is about the correlation between dust storms and hurricanes. We think that dust particles are reducing the tropical storm risk for Dominican Republic and Puerto Rico, preventing the formation of hurricanes, and lowering the number of them formed in this area. As we know hurricanes are formed under specific conditions like water of at least 26.5 C, high humidity, low amounts of wind shear, and 5 of latitude away from the equator, but it is obvious that without warm surface water a storm cannot survive.

The dust storms that occur in Africa are caused by strong winds that remove the smallest particle of sand to saltate or leap, and this stays suspended in the air, where wind currents to the Atlantic Ocean transport it.

These particles are classified as aerosols, just like sea spray, burning fossil fuels, volcano ashes, etc. All these aerosols affect the temperature in certain areas because they block the sunlight. This means that the aerosols are cooling PUERTO RICO AND DOMINICAN REPUBLIC. Certain tests have proven that aerosols reflect the sunlight back into the space by reducing the solar radiation that reaches the surface. All of this varies depending on the size of the aerosol particles.

“The net effect of aerosols is to cool the climate system by reflecting sunlight. Depending on their composition, aerosols can also absorb sunlight in the atmosphere, further cooling the surface but warming the atmosphere in the process. These effects of aerosols on the temperature profile, along with the role of aerosols as cloud condensation nuclei, impact the hydrologic cycle, through changes in cloud cover, cloud properties and precipitation.” *Nature* 419, 215-223 (12 September 2002) | doi:10.1038/nature01091;Yoram J. Kaufman, Didier Tanré, Olivier Boucher.

We believe that the aerosols are reducing hurricane activities because aerosols alter the condition in which the storms are formed like cooling the surface water. This study is just the beginning of a greater research we will conduct in the years to come.



## GLOBE Learning Expedition 2008

Saturday, 21 June PARTICIPANTS ARRIVE	Sunday, 22 June REGISTRATION OPENING DAY	Monday, 23 June PLENARY EVENTS	Tuesday, 24 June PLENARY EVENTS
6:30 – 8:30 Breakfast (dormitory residents)	7:00 – 9:00 Breakfast (dormitory residents) 7:30 – 12:30 Shuttles run between Dormitory and Upper Campus	6:30 – 8:00 Breakfast (dormitory residents) 7:30 – 8:00 Shuttles to Plenary	6:30 – 8:00 Breakfast (dormitory residents) 7:30 – 8:00 Shuttles to Plenary
8:00 – 18:00 Registration , travel & tours information desk open  <i>Molly Blackburn Hall</i>	8:00 – 18:00 Registration , travel & tours information desk open <i>Molly Blackburn Hall</i>	8:30 – 10:00 Plenary Session <i>Jameson Hall</i>	8:30 – 10:00 Plenary Session <i>Jameson Hall</i>
	8:00 – 12:00 Exhibit set-up <i>Leslie Hall</i>	10:30 – 12:00 Breakout Session 1 <i>Leslie Hall</i>	10:30 – 12:00 Breakout Session 3 <i>Leslie Hall</i>
	11:00 – 12:15 Lunch <i>Graca Machel Dining Hall</i>	12:00 – 13:15 Lunch and Exhibits <i>Leslie Hall</i>	12:00 – 13:15 Lunch and Exhibits <i>Leslie Hall</i>
	13:00 – 14:00 Logistics & safety briefing, all students and participants <i>Leslie Hall</i>	13:30 – 15:00 Breakout Session 2 <i>Leslie Hall</i>	13:30 – 15:00 Breakout Session 4 <i>Leslie Hall</i>
	14:00 – 15:00 Students line up for procession <i>Outside Leslie Hall</i>	15:15 – 16:30 Cultural Presentations <i>Jameson Hall</i>	15:15 – 15:45 Field Day Preparation for Students <i>Jameson Hall</i>
14:00 – 14:30 Logistics & safety briefing for chaperones, group leaders <i>Leslie Hall</i>	16:30 – 17:00 Shuttles to dinner	15:15 – 17:00 Take down exhibits and posters	
15:00 – 17:30 Opening Ceremony Parade of Students <i>Jameson Hall</i>		15:45 – 17:00 Shuttles to dinner	
18:00 – 20:00 Dinner <i>Graca Machel Dining Hall</i>	17:30 – 18:30 Dignitary and Press Exhibit Viewing	17:00 – 18:30 Dinner <i>Graca Machel Dining Hall</i>	16:30 – 18:00 Dinner <i>Graca Machel Dining Hall</i>
	17:30 – 18:30 Shuttles to Student Dinner	18:15 – 18:45 Shuttles to Cultural Presentations	18:00 – 18:30 Shuttles to Cultural Presentations
	18:00 – 19:30 Student Dinner <i>Graca Machel Dining Hall</i>	19:00 – 22:00 Cultural Presentations <i>Jameson Hall</i>	19:00 – 22:00 Cultural Presentations <i>Jameson Hall</i>
	18:30 -21:00 Dignitary Dinner (by invitation) <i>transport provided</i>	22:00 – 22:30 Shuttles to Dormitory/Hotel	22:00 – 22:30 Shuttles to Dormitory/Hotel
	18:45 – 19:30 Shuttles to Student Icebreaker		
	20:00 – 22:00 Pre-Conference Student Icebreaker <i>Jameson Hall</i>		
	22:00 – 22:30 Shuttles to dormitory		
23:00 Curfew	23:00 Curfew	23:00 Curfew	23:00 Curfew

Please see detailed agenda for shuttle pickup times



## 22–27 June 2008, Cape Town, South Africa

Wednesday, 25 June	Thursday, 26 June	Friday, 27 June	Saturday, 28 June
GLOBE FIELD DAY	GLOBE FIELD DAY	PLENARY EVENTS	PARTICIPANTS DEPARTURES
6:30 – 7:30 Breakfast (dormitory residents) 8:00 Busses Depart for Field Day	6:30 – 7:30 Breakfast (dormitory residents) 8:00 Busses Depart for Field Day	6:30 – 8:00 Breakfast (dormitory residents) 7:30 – 8:00 Shuttles to Plenary	6:30 – 8:00 Breakfast (dormitory residents)
<b>FIELD DAY</b> Group One (“Plants”): Southern Sites (Cape of Good Hope, Global Atmosphere Watch Station) Group Two (“Animals”): Northern Sites (Tygerberg Nature Reserve, Edith Stephens Wetlands Park)  12:00 – 13:30 Lunch Group One (“Plants”): Cape Pointe Group Two (“Animals”): CPUT <i>Highlights:</i> Group One (“Plants”): Penguins Group Two (“Animals”): Local Market  18:00 Busses Return to Dormitory  18:00 Shuttle to hotel  18:45 – 19:00 Shuttles to dinner	<b>FIELD DAY</b> Group One (“Plants”): Northern Sites (Tygerberg Nature Reserve, Edith Stephens Wetlands Park) Group Two (“Animals”): Southern Sites (Cape of Good Hope, Global Atmosphere Watch Station)  12:00 – 13:30 Lunch Group One (“Plants”): CPUT Group Two (“Animals”): Cape Pointe <i>Highlights:</i> Group One (“Plants”): Local Market Group Two (“Animals”): Penguins  18:00 Busses Return to Dormitory  18:00 Shuttle to hotel  18:45 Shuttle from Hotel to Dinner	8:30 – 10:00 Plenary Session <i>Jameson Hall</i>  10:00 – 12:00 Working Session <i>Jameson Hall</i>  12:00 – 13:15 Lunch <i>Leslie Hall</i>  13:45 – 15:45 Closing Ceremony <i>Jameson Hall</i>  15:45 – 16:30 Shuttles to Dormitory/Hotels	8:00 – 18:00 Travel & Tours Information Desk Open <i>Graca Machel</i>
19:30 – 22:00 Alumni Hosted Event with Dinner <i>Jameson Hall</i>  22:00 -22:30 Shuttles to Dormitory/Hotel	18:00 – 19:30 Dinner <i>Graca Machel Dining Hall</i>  19:00 – 20:00 Shuttles to Cultural Presentations  20:00 – 22:00 Cultural Presentations Alumni Event Wrap-Up <i>Jameson Hall</i>  22:00 – 22:30 Shuttles to Dormitory/Hotel	17:00 – 17:45 Busses leave for MOYO from Dormitory  17:30 Bus leaves for MOYO from Newlands Hotel  18:00 – 21:00 Dinner at MOYO  21:00 Busses return to Dormitory/Hotel	
23:00 Curfew	23:00 Curfew	23:00 Curfew	



**ESTONIA**

**School:** Tallinna Science Secondary School

**Title:** Forest-fire danger in forest areas of Tallinn

**Abstract:** Earth’s climate is changing its influence is noticeable also in Estonia. Drought periods are getting common in summers, so the forest fire danger is getting higher at times. While soils are quite sandy and air pollution is a problem in Tallinn, the capital of Estonia, it is important to protect forests and woodlands against fire in Tallinn city area.

Research author decided to verify the forest fire danger using the GLOBE program’s fire fuel protocol and added his own complementary method. These methods were similar.

For research the author chose 10 locations of study sites which all are in forested areas in Tallinn City or near Tallinn. Study sites were in suburbs. Author’s hypothesis before research told that the highest forest-fire danger is in Männiku and Raku forests and lowest danger in Nõmme and Merimetsa forests. To compare forest-fire danger, author made measurements (including tree height, grown height, sprig existence, presence of other factors), compared all factors and compiled score-system.

With the help of research the author got to know other interesting information about common pine’s canopy and verified locations with lower or higher forest fire danger. The result showed that fire danger in different areas was quite similar.

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**FINLAND**

**School:** Juahni Aho’s school, Iisalmi

**Title:** Phenology research – trees green up in Iisalmi

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**FRANCE**

**School:** College Cantelande, Cestas

**Title:** The role of CO<sub>2</sub> in global warming

**Abstract:**

**Objective:** Make experiences to determine if CO<sub>2</sub> plays a role in the global increase of temperature.

**Experience:** We fill clear tubes with variable quantities of CO<sub>2</sub>, enlighten them for 5 minutes and measure the increase of temperature inside the tubes.

**Experimental protocol:**

- Fill the tube if the CO<sub>2</sub> quantity wanted.
- Note the temperature at the beginning of the experience
- Enlighten for 5 minutes
- Note the temperature at the end of the experience
- Repeat the experience several times with different CO<sub>2</sub> quantities

**Results:**

- Note the measured values in a table
- Construct a chart indicating the value of temperature variation depending on CO<sub>2</sub> quantity

**Results analysis:** We must be able to demonstrate that the variation of temperature difference increase with the quantity of CO<sub>2</sub> in the tube.

**Conclusion:** It is an experience, not a modeling of what’s happening in the atmosphere. The results found out are a mere indication of the influence of CO<sub>2</sub> quantities on warming, but cannot allow us to conclude on the global level because there are a lot more factors that can intervene.

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*Monday 23 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

*Monday 23 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*



**School:** Lycee Roosevelt – Reims

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** SAT – HYDRO: Study of a watershed using satellite data in the Champagne-Ardenne Region North-East of FRANCE

**Abstract:** The study of a watershed began 3 years ago but at that time nobody was thinking of the local river. We were studying some applications of the location by satellite and one of them was the use of GPS data and a yield sensor equipping a combine harvester to get a yield map while harvesting to diminish nitrogen pollution of the water in our region by using the yield maps to monitor fertilizer inputs in the fields. That led to the study of our local waters and the discovery of the large amount of nitrogen either in the local rivers or in the groundwater. And then, very quickly, the facts that river pollution cannot be attributed only to people living and working along the river, that it could be attributed to activities implemented a long distance from the river, led the students to discover the existence of a watershed zone. So it was decided to build a model of the area around the river in order to find the watershed divides, to acquire some hydrological data and compare them with meteorological data to discover how the river is functioning and to organise series of biological and chemical measurements to follow the evolution of the water quality. Step by step, the whole watershed began to take form and reality, so from now on, protecting our waters is going to be a community job.

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**School:** College La Chênaie, Mouans Sartoux

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** Calisph’air project at Collège «La Chênaie» at Mouans Sartoux.

**Abstract:** We set up our project in June 2006. We picked 13 year-old third form pupils, who had special interest in science. Our project can be split into two parts, during two years:

- During the fourth class, the students have worked about atmospheric pollution and the influence on greenhouse effect. They learnt how to use the solar photometer to know the quantity of aerosols in our atmosphere. Also, they learnt to explain the graphics recorded by Calipso.
- For the year followed, during the third class, the pupils studied the impact of atmospheric pollution on Mediterranean Sea: they wondered about the effect of atmospheric pollution and the greenhouse effect on the ocean movement and on plankton.

Our headmistress supported us and gave us an extra hour a week when we could work in better conditions with smaller groups. During these hours, as we were taught in Toulouse in May 2006, at the “globe” meeting, we implemented Paul Adams’ training so that the pupils could master the required theoretical notions. We used and applied the investigation method: our pupils had to prepare, and then later, carry out their own experiments. They learnt notions such as the parasol and the greenhouse effect, the aerosols, the types of clouds, the ozone pollution, the earth atmosphere and the other planets atmosphere. They were able to build their own sensors. After all this work, the students made some observations about our environment:

- First, for 2 years, we have noticed an increase in temperature. In summer, we have scorching heat.
- We realized an inventory of asthma attacks in our school, with the help of our lady doctor. It showed that we had, during 2006, 1.5 more attacks in our school in comparison with all the school of the department.

So, the students wondered: why are the temperatures so high in our district and why are there a lot of person who suffer about asthma attacks? With the help of our lady doctor, we have established that all the schools, where there are several people who suffer about asthma attacks, are all situated near a motorway or a big road. Moreover, the students saw a prevention film about the irritant properties of troposphere ozone. So, they have formulated some hypothesis: We live in Mouans Sartoux, a very little town between Cannes (where the famous worldwide movies festival takes place) and Grasse (the capital of the perfume).



Our school is located near a motorway, appreciatively 2 miles far, so our students wondered about the effect of ozone’s pollution and aerosols’ pollution on our health.

They use the sensor ZICUA and GLOBE protocol for ozone, the solar photometer and GLOBE protocol for aerosols. In the same time, they collected some meteorological data and used a qualitative method with some tobacco plants sensitive to ozone. With some reference tables, they compared the necroses of the plants and they could determinate the percentage of necroses of where they live.

They also analysed the graphics recorded by Calipso to see if there was a link between ozone’s degree and aerosols’ quantity.

The observations:

The data we have collected permit us to say that:

- There is a link between the temperature, ozone’s degree and asthma attack.
- There is a link between the frequency of the motorway’s cars and the temperature, and, so, with the ozone’s degree.
- We can’t say that there is a link between ozone’s and aerosols’ quantity.

The conclusion:

The motorway has a very high influence on our health. The cars deliver some pollutant gas like CO<sub>2</sub> which develop temperature and so, greenhouse effect. With higher temperature, the troposphere ozone can be produced and with his irritant effect has a real impact on our health and our lungs.

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## GERMANY

**School:** IGS Franzshes Feld, Braunschweig

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** Structural Changes in our Loca Stream to improve Biodiversity

**Abstract:** Year 12 students have been asked to examine the local stream Mittelriede, which runs nearby school, according to the European water quality parameter guidelines. This is planned as a long-time project and will involve several groups of students in following years as part of their environmental studies in biology. 2007 has been the pilot year and cooperations with local water and environment authorities have been set up.

Our research is based on the hypothesis that the biodiversity of macroinvertebrates not only depends on the chemical quality of the water, but also on the stream’s structure. By changing its structure to a more natural way and therefore offering a greater diversity of currents within the stream the biodiversity will increase noticeable, too.

Students used hydrology protocols for collecting data taken at different spots along the stream to gain an overview of its present status and determine quality parameters according to the guidelines, compared data and considered impacts on the water quality along the stream, presented their results to each other and decided on a hands-on activity.

To sum up, there are linkages between the structure of a stream, the chemical water quality and its biodiversity. In order to increase its biodiversity the stream’s structure must be improved as well.

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**School:** Goethe Schule, Wetzlar

*Monday 23 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** The Ozone Exposure in and around our school as well as its Effect on Airway Diseases

**Abstract:**

**Introduction:** The Project has been initiated cooperatively by the students of the Goetheschule and Kingsburg High School in USA in the beginning of 2007.

### Hypotheses and Research Questions

1. The concentration of ozone at ground level is proportional to the air temperature and disproportional to the cloud coverage as well as the relative air humidity.
2. The ozone-concentration correlates with the airway diseases and worsen the local climate and thereby the health in the school and its surroundings.



3. The quality of air in Wetzlar has improved in the last years.
4. The varying ozone exposure can be verified through lichens as bio-indicators.

**Material and Methods**

In the study we examined lichens, interviewed students about their respiratory system and took measures of the ozone concentration in and around Goetheschule in Wetzlar, Germany.

**Results**

1. We could prove that the ozone concentration is proportional to the air temperature and disproportional the cloud cover both at the measuring point at the Goetheschule and at the measuring point in the city center.
2. Our hypothesis that the ozone concentration is disproportional to the air humidity could not be confirmed.
3. A correlation between ozone concentration and the number of airway diseases in the clinic in Wetzlar could only be partly proved. The weather conditions and changing ozone concentrations have very likely a rise of airway diseases.
4. The function of lichens as bio-indicators for ozone could not be verified. Comparison with a lichen mapping of the year 1996 shows that a further species, which is an indicator for very good air quality, was specified.

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**INDIA**

**School:** Apeejay Public School, Delhi

**Title:** Atmosphere

**Abstract:** The GLOBE Program when implemented in the school promoted environmental awareness among students. GLOBE promoted and supported teachers, students to collaborate on investigations of the environment and the Earth system. It helped the students in collection, examination and interpretation of the data they have collected and also helped in developing the processing skills which largely contributed in enhancing their scientific understanding.

It was assumed that the students in the GLOBE program will observe and make measurements, record data, come to understand accuracy and precision, share their data with other students and scientists. They will work with real data, some that they collect, and some that they obtain from other GLOBE schools. Students will work on cloud type protocol, cloud cover protocol, contrail type and cover protocol, precipitation pH protocol.

The objective of this programme was to:

1. Promote environmental awareness
2. Promote examination and interpretation skills
3. Enhance the students scientific understanding
4. Develop the processing skills in students
5. Improve the students power of comprehension and analysis

In our school the school ground is the site of observation. Atmospheric measurements were taken at the atmospheric study site so that, students can have daily access to it. Students took the cloud cover measurements at the same site and time as the cloud type measurement. They referred to the GLOBE cloud chart and the definitions found on the observing cloud type sheet. Cloud cover was also observed at the same time and site. Contrail cover was measured by looking at the sky in every direction at the atmospheric site. pH of the rainfall was also measured with the help of pH indicator paper. Students recorded the data they gathered, saved it in school data record, and sent it to the GLOBE Student Data Server using the Internet and the World Wide Web.

GLOBE helped students to improve their achievement in science and math, and in the use of computer and network technology. It increased student awareness of their environment from a scientific viewpoint. It improved their understanding of science because it involves them in performing real science- taking measurements, analyzing data, and participating in research. The observation capability of the GLOBE students is enhanced due to precise working on the protocols. As a globe student, they assist scientists by taking accurate measurements and sharing their data through the internet.



GLOBE is an ideal program for involving students to sensitize and to provide hands-on experience to students to collect and analyze the environmental phenomena and its related data. GLOBE program has helped in enhancing the environmental awareness of individuals throughout the World.

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**KAZAKHSTAN**

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2B, Leslie Hall*

**School:** Zelyonoborskaya School Gymnasium, Zelyony Bor, Kazakhstan

**Title:** Drinkable water and its influence on people’s health

**Abstract:** The purpose of the scientific project is identification of the quality of drinkable water of Zeleniy Bor and of Schuchinsk, and the investigation into the influence of high consistent fluorine, calcium and magnesium salts on people’s health.

Tasks of the study:

- The collection of water samples from the waterhole of Zeleniy Bor
- The chemical water analysis
- Discovering of the diseases passed through water
- The preventing of possible diseases due to the high salts consistent in the water

Hypothesis:

If we determine the quality of drinkable water in Zeleniy Bor and establish the possibility of diseases being caused by poor quality of drinkable water, we can propose methods of prophylaxis towards preservation of people’s health.

Methods of research:

- The chemical analysis of drinkable water,
- The statistical research into kidney stone disease and caries of tooth enamel,
- Literature search on the subject of investigation.

Practical results:

The salt content of the drinking-water of Zeleniy Bor and Schuchinsk exceeds the norm . The common water hardness of Zeleniy Bor makes 17 micro equiv. /dm<sup>3</sup>, which exceeds the norm by more than 4 times. The drinking-water of Schuchinsk contains fluorine 3,96 mgs/l, compared to the norm of 1,5 mgs/dm<sup>3</sup> [1]. This causes distribution of kidney stone illness, caries of dental enamel and fluorosis.

From a study of the records of medical establishments, 10% of the population of Zeleniy Bor appealed for medical help to combat diseases which are caused by the use of drinking water with high hardness levels. More than 30% of the children in Schuchinsk city suffer from tooth enamel decay.

Such information gives rise to alarm, and a determination to find the methods of reducing the concentration of salts in water.

The known methods of reducing concentration of salts in water are boiling and freezing. We tested both methods and got the following results:

The concentration of fluorine is reduced by boiling by 10%, and by freezing by 15%.

Hardness in water is reduced by boiling by 30 %, and by freezing by 75 %.

Conclusions:

High retention of salts of calcium and magnesium causes high inflexibility of drinking-water, which is instrumental in the appearance of kidney stone illness for habitants in the area of the Zeleniy Bor, and the high retention of salts of fluorine in water causes fluorosis of dental enamel for the children of Schuchinsk town.

The drinking-water of these settlements needs cleaning.

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**School:** Zelyonoborskaya School Gymnasium, Zelyony Bor, Kazakhstan

*Tuesday 24 June, 13:30-15:00 Session, Room #LS2B, Leslie Hall*

**Title:** The Health Effects of Mineral Concentrations in Potable Water

**Abstract:** The purpose of this study is to evaluate the quality of drinking water in Zelyony Bor and Shchuchinsk, Kazakhstan, and determine the effects of high fluorine, calcium and magnesium salt levels on local health. The study asks if certain diseases in Zelyony Bor are the result of poor drinking water quality, and if water treatment methods can be introduced to reduce their adverse effects. The research methods include chemical analysis, statistical research, and a literature search. The research found the salt content of drinking-water exceeds normal levels. The water hardness of Zelyony Bor is 4 times the norm at 17 micro equiv. /dm<sup>3</sup>. Shchuchinsk’s water contains fluorine 3,96 mgs/dm<sup>3</sup>, compared to the norm of 1,5 mgs/dm<sup>3</sup>. These levels can cause kidney stone illness, dental enamel caries, and fluorosis. Ten percent of Zelyony Bor’s population applied for medical help for these diseases and more than 30% of children in Shchuchinsk suffer from tooth enamel decay. Methods of reducing salt concentrations are boiling and freezing water. Both methods were tested with the following results. Boiling reduced the concentration of fluorine by 10% and freezing by 15%. Boiling also reduced water hardness by 30% and freezing by 75%. In conclusion the high rate of calcium and magnesium salts causes kidney stone illnesses in Zelyony Bor and the high rate of fluorine salts causes dental enamel fluorosis among Shchuchinsk’s children. The high salt concentrations in potable water in these settlements needs to be reduced.

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**LATVIA**

**School:** Rujiena Secondary School, Rujiena

*Monday 23 June, 13:30-15:00 Session, Room #LS2D, Leslie Hall*

**Title:** The climate changes in Rujiena

**Abstract:** Of late year’s community increasingly shows interest in climate changes. In Rujiena Secondary School we have been exploring atmosphere and climate.

The target of our research work is to find out an effect of climate changes in our city Rujiena.

We hypothesized that abnormal natural phenomenon and temperature rising, are big problem in all world and in Rujiena too.

We have been collecting temperature measurements from 2004 till 2008. We calculated mean temperatures for every month from 2005 till 2008. From results we can see, that there is no very big temperature differences in this period.

For research we use TAYLOR digital thermometer, which measures maximum and minimum air temperature °C. Now we can see, how the temperature had grown and fallen during these years.

Our conclusions are, that there are many opinions about global warming. Many people question whether or not global warming exists. Some people think that the global warming is just a myth. In Rujiena there are seen the temperature anomalies and it rises, so we think that it prows the global warming.

Our research time is too short to make deep and considerable analysis.

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**MADAGASCAR**

**School:** Lycee Laurent Botokeky, Toliara I

*Monday 23 June, 13:30-15:00 Session, Room #LS2D, Leslie Hall*

**Title :** Climate parameters influence on mosquito larvae development

**Abstract:**

**PURPOSES OF THE EXPERIMENT**

- To identify the development conditions of anopheles larvae: climate factors and water quality
- To imagine a fight against larvae by using Neem extract



**HYPOTHESIS**

Anopheles larvae may develop sequel to global warming  
Their proliferation reduced by changing water quality in the breeding sites

**PROCEDURES**

- Study on permanent and temporary breeding sites following 4 protocols:
  - capturing larvae
  - identifying anopheles larvae and other ones
  - evaluating larvae rate,
  - studying water quality and local climate
- In classroom
  - identifying and isolating larvae
  - separating larvae according to their evolution steps and breeding sites
  - putting them into test tubes for incubation
  - Study on the influence of Neem extract over anopheles larvae development
  - Neem extract : leaves pounded then filtered so as to get juice
- Experimental protocol:
  - control tube
  - larvae + 3 ml of Neem extract from its leaves
  - larvae + 8 ml of the same solution
  - Local temperature : 30°C
  - pH : 8 on the control
  - pH : 10 in both test tubes

Observation of larvae development after 12 hours

Principal Results:

- Larvae density has correspondingly raised with the raise of temperature
- Development slowed down in both test tubes compared with the control
- larvae develop fast during rainy season

Conclusions:

We can stop mosquito larvae development by adding Neem extract into breeding sites  
Global warming make anopheles more numerous

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**NETHERLANDS**

**School:** College de Heemlanden, Houten

**Title:** Influence of traffic on the air quality

**Abstract:** We have studied the quality of the air around Houten, a village in the Netherlands. We have decided to focus our research on the influence of traffic on the air quality. We have used the concentration of particulate matter (PM10), NO<sub>2</sub> and SO<sub>2</sub> in the air as indicators of the pollution. We have also examined the effects of these exhaust gasses on the human health. Our hypothesis was that during rush hour there is a higher concentration of particulate matter.

Furthermore, we had an interview with the chairman of the Dutch cyclist federation. This organization has tested the levels of pollution in Houten. They measured the concentration of particulate matter in the air on different cycling paths throughout Houten.

Furthermore we held a survey about the means of transportation of teachers at our school.?

The purpose of our experiments was to comprehend the influence of traffic on the air quality, how much our teachers contribute to the pollution, to what amount of dirty air cyclists are exposed and what the effects of the pollution are on our health.

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*Monday 23 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*



**School:** Sint- Maartenscollege, Maastricht

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** Environment and health in and around Maastricht, the Netherlands

**Abstract:** Our home town Maastricht, the Netherlands is localized in the heart of one of the most industrialized regions in the world. The purpose of our project is to investigate the influence of air pollution on the health of the inhabitants of Maastricht, in particular the youth. We hypothesize that there is a correlation between the degree of air pollution and health parameters such as pulmonary function. We measured the aerosol optical density near our school which is located within 250 meters of a major highway crossing in Maastricht. Furthermore we studied the data obtained in a recent study by the Maastricht University on the relationship between ambient particulate matter and pulmonary function in children.

Our analysis shows (1) that there are different methods to analyze our pollution with particulate matter and (2) that PM composition, specifically oxygen radical formation by PM is influencing the lung function of children.

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## NORWAY

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2D, Leslie Hall*

**School:** Bodø Videregående Skole

**Title:** The future of Coastal Cod (*Gadus morhua*) in the region of Salten in northern Norway under influence of global warming and persistent organic pollution.

**Abstract:** This study is our consideration of the future of Coastal Cod in our region. This report was motivated by the competition announced by the Norwegian Centre for Science Education. In order to reach the defined learning skills for the Science of Nature in our school, we have chosen to examine the future of Coastal Cod in Salten under influence by environmental poison and global warming. Through this task we have been able to learn and understand more about global warming, pollution and how it may influence the local food supply from the sea.

In the text below we ask the important question: How is the future for Coastal Cod? We have examined and measured six different individuals of this species in Salten. The length and weight of each fish was measured, and used to calculate the condition factor. This factor is an indicator of the health of the individuals. We sent filet from five of the six codfish to the Norwegian Institute for Air Research. They measured the level of environmental toxins. The results are not ready yet, but will be used in the project Global POP.

Our individuals of fish seem to be in good condition, but will this state continue for the local population of Coastal Cod? We and other scientists have to make further measurements and studies. Some years from now, the arctic fish species may have a lower condition factor and begin to seek colder territories because of warmer temperature of the sea. Atlantic Cod and Coastal Cod are among of the most abundant and important fish populations in the world. Maybe, we will end up losing these populations that have given food to our nation for ages.

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**School:** Bergen Katedralskole

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** Water never runs astray

**Abstract:** In this project we've tried to answer whether the freshwater availability in Africa will be affected by climate changes. In addition to this, we also wanted to find out if there were any simple measures that could prevent the negative outcomes if there should be any.

Since we had difficulties finding reports and data on the subject at the library etc., most of our data comes from online reports and other internet sources.

We also included an experiment of our own in this project, where the goal was to create a device that made it possible to extract freshwater from saltwater manually. From this experiment, we learned that it is possible to extract freshwater this way, but it requires too much energy to be used on a large scale.

From the project as a whole, we can say that the predicted climate changes are going to affect the freshwater availability on the continent, but that at least some of the negative changes can be prevented by goal-oriented planning by the governments to secure sufficient amounts of freshwater, viable use of freshwater resources, and focusing on farming methods better suited for a new climate.

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**School:** Vang Barne- og Ungdomsskule, Vang i Valdres

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2D, Leslie Hall*

**Title:** Is it possible to observe local climate change at Vang in Norway?

**Abstract:** We have heard about climate change for years and we have tried to see if it is possible to observe the change here in Vang, far from the sea.

We have tried in three different ways to find possible changes, and discuss why it has changed and whether it is because of climate change or not.

1. We have compared old photos with new ones, taken at the same spot, looking for changes in the amount of trees and bushes.
2. We have compared the temperatures during the last 4 years with temperatures in Vang in the period 1961–1990.
3. We have compared phenological observations from the last years with observations taken by a local doctor in Vestre Slidre 130 years ago. Vestre Slidre is 25 km from Vang, but we have collaborated with the school in Vestre Slidre, so we know the difference from Vang to Vestre Slidre. The observations should show whether the spring comes earlier today than 130 years ago.

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## POLAND

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall*

**School:** Gimnazjum No 9, sw. Krolowej Jadwigi, Rzeszow

**Title:** Assessment of the purity class of the Wislok River

**Abstract:** The aim of the above project was to assess the purity class of the Wislok River. The research was carried out from November 2006 to March 2007.

The quality of both surface waters and groundwaters turned out to be unsatisfactory. According to the data of the Provincial Inspectorate of Environmental Protection in Rzeszow, the analysis of the quality factors proved that there was a lack of good quality waters among the monitored rivers. Good quality of the waters was defined in 4 different control and measurement spots, which constituted 5.1 % of all the monitoring spots. 46.8 % of the control and measurement spots of the examined rivers was classified as the III class which illustrated satisfactory quality of the waters. Bad quality of the waters was affirmed in 3.8 % of the control and measurement spots, and it concerned rivers which had been exposed to the interaction with considerable amount of industrial waste or municipal sewage.

In order to assess the condition of water in the Wislok River we set ourselves a few tasks, that is to say, we put ourselves in the role of scientists and decided to find the answer among the people and surrounding nature. We commenced the project with preparing a survey for the local people. Thanks to the survey we found out what the people of Rzeszow think about the contamination of the Wislok River. Afterwards, for 4 consecutive months (from November to late March) we carried out physicochemical examination of water once a week. Moreover we conducted biological research of the river, applying Baur's method, as we are aware that the organisms living in the river can tell us a lot about the purity level of the

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water under discussion. On the basis of our research, observations and interviews with the local people we found out the most common reason for the contamination of the Wislok River. Furthermore, we familiarised ourselves with the ordinance of the Ministry of Environment, 27th November 2002, regarding the requirements for the surface water deposits which are used to provide people with the water meant for consumption.

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**School:** Complex of Secondary Schools, Przysucha

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** Tendencies of Changes of Temperature in Przysucha

**Abstract:**

The members of the Globe program in secondary school of John Paul II in Przysucha make systematic meteorological measurements.

Przysucha is a small county town located in the central Poland. Measurements of the current temperature were taken in the so called “weather station” situated by our school; geographical location: 51,3667 N, 20,6333 E: altitude 205 meters above the sea level.

Students chose to make the measurements during one week of each season of the year 2005 and 2007 (spring, summer, autumn, winter). The measurements were taken at 6 a.m, at noon, and at 6 p.m according to UT time.

The charts clearly show the growth of temperature in Przysucha. This diversity depends on the different air mass flowing to Poland, shape of the area surface, the amount of sunlight, the type of the surface, plants, the neighbouring area of the town as well as on the type of weather, cloudiness and wind.

While comparing the meteorological data from 2005 and 2007 we can see that the temperature diversity reaches even a few degrees centigrades e.g in summer 2005 and 2007. In 2005 from the 10th to the 16th of August the temperature was from 15°C to 21°C, whereas during the same season in 2007 the temperature was from 20°C to 32,5°C. Only the week of autumn was warmer in 2005 than 2007 at 1200 and 1800. The least temperature diversity appeared in spring and in autumn. Some values were even similar e.g on the 29th of April and on the 10th and 14th of August.

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**SENEGAL**

**School:** Lycee Seydina Limamoulaye, Dakar

**Title:** Globe integration program in environment education and in science education for sustainable development

**Abstract:** If environmental education and scientific research disciplines are essential for sustainable community development, they have not yet imposed in education systems. Through the implementation of its technological capabilities; the **GLOBE program** is an additional asset to the educational, scientific, technological and environmental policy.

How can we integrate this program into the teaching of sciences?

How can this integration promote sustainable development for communities?

The setting up of a weather station inside the school equipped with a thermometer, rain gauge and a cloud map help our students to record climate data.

Then our students use the computer to compile and process the data collected. Thus they realise monthly charts as well as a yearly table of climatic data. Those data banks produced will be available to the whole educational system and environmentalists.

The data will be used in class furthermore in awareness raising campaigns on environmental issues.

The GLOBE program should be integrated at all levels of studies. It can lead to the creation of a national and international system for students, teachers and environment specialists who collect and exchange data. Thus they will contribute to better the teaching, the learning of sciences and the protection of environment.

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**SOUTH AFRICA**

**Schools:** Hibernia Primêr, Heidedal Primêr, Delville Park Primêr, Rosemoor Primêr

*Tuesday 24 June, 13:30 – 15:00 Session,  
Room # LS3B, Leslie Hall*

**Title:** Adopt a River Project: A combined effort of the schools in the George Region in collaboration with the Eden District Municipality

**Abstract:**

**Background:**

- Population increased dramatically-25% increase between 1996 and 2001.
- Southern Cape’s Garden Route currently experiencing a tremendous increase in development (housing, industry, golf courses etc).
- Most rivers in Southern Cape originate from the Outeniqua Mountains which is largely conserved by Cape Nature within the Outeniqua Nature Reserve.
- Nature Reserve plays vital role in protecting water resources on which the booming Southern Cape depends.

**Problem Statement:**

Today in South Africa people settle themselves anywhere, even along riverbanks. Poor management of water catchment areas has resulted in death of aquatic organisms. This is because nothing is being done about what is happening upstream. Problems resulting from this include:

- The Gwaing river system illustrates the seriously negative impacts of urbanisation on a river that originates within a near pristine environment above the town of George and emerges at its estuary as an impacted, polluted notorious river.

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**School:** Indwe Secondary School, Mossel Bay

**Title:** Medicinal Plants

*Tuesday 24 June, 13:30 – 15:00 Session,  
Room # LS3B, Leslie Hall*

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**SPAIN**

**School:** IES Federico García Lorca, Las Rozas de Madrid (Madrid)

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**Title:** The Guadarrama River in Central Spain: environmental research on water quality

**Abstract:** The purpose of this research is to prove the fact that the Guadarrama water loses quality between the upper and the medium courses due to human influence, especially urban development. This study focuses on the analysis of the pollution levels in both the upper and the medium courses of the Guadarrama River. Measurements have been taken in towns such as Collado Villalba (upper course), La Navata and Las Rozas de Madrid (medium course), where our high school is located.

In order to verify this hypothesis we used The GLOBE protocols (Hydrology) obtaining the following results: In the Guadarrama River several differences between the upper and the medium courses were noticed, especially in the turbidity, dissolved oxygen, electrical conductivity, total nitrogen (NO<sub>x</sub>-N) and alkalinity levels of the water. The main conclusion of the research is the fact that, as the river flows approaching the medium course, all these values become detrimental to the fluvial and riverside ecosystems.

The Guadarrama River headwaters are located in the Guadarrama Range. From here, it flows by a number of towns and residential estates, namely Guadarrama, Collado Villalba (upper course), La Navata, Parquelagos, Los Jarales and Molino de la Hoz, then reaching Las Rozas de Madrid (medium course).

This research has helped us to realize the importance of human influence on water quality and to become aware of the fact that the towns located on the Guadarrama riverside must have a sustainable development in order to avoid further environmental damage. This has also led to the conclusion that water depuration systems are needed in order for the water to be reused, not only by humans but also by the different living organisms in those ecosystems.

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## TANZANIA

**School:** Kibaha Secondary School

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** Effects of mercury contaminated food on growth of mice ‘mus musculus’

**Abstract:** This small research was carried out by students from the school’s environmental club. In this study the effects of mercury contaminated diet on growth of mice, *Mus musculus*, were investigated. Mice were exposed to mercury for 5 days, and then fed on mercury free food for another 5 days. From day 10 to day 15 they were fed on mercury contaminated food, as well as from day 20 to day 25. As days of exposure to mercury increased, the rate of growing of mice was observed to be slow as compared to uncontrolled mice. Also the rate of feeding decreased for the mice exposed to mercury. The study have established that prolonged exposure of organisms to mercury is very toxic and affects physiological processes like growth and can alter the feeding habit as was shown by the experimental mice.

Mercury intoxication have caused decrease in growth rates of the mice; and the observed decrease in feeding rate of the mice might have been caused by the corrosive actions of mercuric chloride which cause pains and sometimes vomiting.

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**School:** Mailimoja and Kibaha Secondary School

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall)*

**Title:** Domestic Water Quality Status at Kibaha Town

**Abstract:**

The water quality from the river Ruvu, which is the source of domestic water supplies for Kibaha town and Dar es Salaam, was measured based on the GLOBE hydrology protocols. Water sample were analyzed from untreated reserve water at water treatment plant. Then treated water at the treatment plant and at the other four locations were analysed for temperature, pH, turbidity and conductivity.

# Environmental Resource Management

The City of Cape Town’s Environmental Resource Management (ERM) Department is tasked with leading the implementation of the City of Cape Town’s overarching environmental policy, the Integrated Metropolitan Environmental Policy (IMEP).

IMEP forms the framework for a series of strategies and programmes aimed at ensuring that the principles of environmental sustainability are adhered to.

Working in close collaboration with other City departments and stakeholders, the ERM Department focuses on areas such as:

- Environmental Policy and Strategy
- Project and Partnership Development
- Integrated Environmental Management
- Biodiversity Strategy Coordination
- Nature Reserve Management
- Alien Invasive Species Coordination
- Heritage Management
- Coastal Coordination and Coastal Zone Management
- Resource Management (e.g. water, waste and energy)
- Energy and Climate Change
- International Conventions and Programmes
- Sustainable Livelihoods
- Cleaner Production and Sustainable Procurement
- Environmental Education, Training and Communications
- Organisational Environmental Performance.

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Results have shown that the water treatment plant is very effective in removing water turbidity.

- The pH of treated water at various locations is more or less the same as that of treated water at the water treatment plant.
- The turbidity at various locations is more or less the same but less turbid than treated at the treatment plant.
- Conductivity at various locations increased slightly when compared to treated water at the treatment plant.
- The temperature was more or less the same at all sampling locations.

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**THAILAND**

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2B, Leslie Hall*

**School:** Roong Aroon School, Bang Khun Thian, Bangkok of Thailand

**Title:** Rainfall pH in Different of Land Uses at Bangkok of Thailand

**Abstract:** In 2005, the Pollution Control Department reported that the average annual rainfall pH of the Bangkok Metropolis was 4.89. This regarded as acid rain. Thus, we interested to investigate the rainfall pH in different of land uses in Bangkok. Our study sites were a thinly populated area, a densely populated area, a heavy traffic area, an agricultural area, and an industrial area. We followed the GLOBE Protocols for measuring the rainfall pH. We collected the rainfall everyday from June 21 to September 10, 2007. The pH meter was used. Our project results showed that in different land uses, the rainfall pH were different. The rainfall pH at the industrial area and heavy traffic area were lower (higher acidity) than the residential area and agricultural area. During our study period, no acid rain found. In addition, when rain occasionally fell, the rainfall pH on the first day after the pause was lower (higher acidity) than that of before the pause. While rain continuously fell for several days, the rainfall pH on the last day was slightly higher (lower acidity) than the first day.

**School:** Dara Academy , Chiang Mai , Thailand

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2C, Leslie Hall*

**Title:** The Effects of Soil Erosion to Water Quality of Three Differential Study Site: Woodland, The Land Development Department, and Community Agricultural of Maerim District, Chiang Mai, Thailand

**Abstract:** This study’s purpose was to determine the effects of soil erosion on the water quality of three different study sites: the woodland site, the Land Development Department site and the Community Agricultural site. All three sites are located in the Maerim district of Chiang Mai, Thailand. GLOBE (Global Learning and Observations to Benefit the Environment) tools were used to study soil types and water quality. The Universal Soil Loss Equation (A= RKLSCP) was used to equate the amount of soil loss. The results of the research were as follows: (1)In the moderate level, as soil erosion increased, the water quality decreased. (2) Depending on the land use, the water quality either related in a negative or positive way. The cleanest water was found in the Community Agricultural site, the next cleanest was in the woodland site, and the most contaminated was in the Land Development Department site. (3) The highest amount of soil erosion, which was at the moderate level, was in the Land Development Department site. The least amounts of soil erosion, at a level of low, were in the woodland site and the Community Agricultural site.

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**TURKEY**

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**School:** TED Polatli Koleji Secondary School, Polatli/Ankara

**Title:** Study of thermal spring waters at Ankara administrative province

**Abstract:** This study is about research of thermal spring waters within Ankara administrative province borders, by the help of applications in GLOBE Hydrology Protocol and additional activities. During the measurements, samples were collected from total of 8 districts of 4 towns of Ankara; Ayas, Beypazari, Kizilcahamam and Haymana, which are famous and rich with thermal sources. In order to reach high accuracy with data, some measurements were performed near springs and rest were carried out at the school laboratory. As a result it is observed that, mineral kinds and mineral amounts which thermal waters contain vary, and depending on several factors, mineral values of thermal waters even vary in very short time intervals.



## UNITED STATES OF AMERICA

**School:** Innoko River Traditional High School, Alaska

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** Integrating Indigenous Athabaskan Deg Hitan Knowledge and GLOBE Measurements in an Alaskan Boreal Forest Study.

**Abstract:** Our cultural traditions depend upon the environment we live in. Hundreds of our ancestral generations have adapted to the land and survived as climates have changed over centuries. Our culture is a subsistence-based culture, i.e. our day-to-day existence is built solely on animals and plants that have adapted to this environment as well. We have co-existed with the plants, animals, rivers and lakes in a natural balance of respect. Our traditional Deg Hitan dances and songs, customs and ceremonies reflect the stability of the environment we live in. Our observations of the living things around us and the changes we have observed/measured comprise this study.

After a fire occurred near our village in 2005, we set up a study site in the newly burned area, a control site (never been burned) and a 30-year old burn site to study vegetation types as well as plant and site characteristics. We used GLOBE protocols to measure air and soil temperature, tree height and circumference, budburst, green-down and soil characteristics. We wanted to find out about forest succession, what grows after a fire, what animals use burned areas, changes in an old burn and unburned site, and how they all compared to each other. We also used the new protocols in the Seasons and Biomes Earth System Science Project to observe freeze-up and break-up in the Innoko River and Shageluk Lake close to our study sites, school and town of Shageluk.

In the newly burned site horsetails (*Equisetopsida*) first appeared a year after the burn, then willows and now birch (*Betula papyrifera*). There is a general trend of earlier Innoko River break-up and birch budburst as well as a later freeze-up and green-down, with budburst trailing break-up in the spring and the reverse in the fall. Our data also indicate that the river ice is much thinner than it was in the past. Rivers and sloughs are used to access different parts of the land for subsistence hunting of ducks and geese. After break-up, rivers are fished for pike and white fish immediately for the large runs right after break-up. In the fall, freeze-up on the Innoko River has been coming later and freezing much thinner which later affects subsistence fishing.

For the 5th year in a row and during the fall of 2007, because the Innoko River did not freeze well due to warm temperatures and rain, it prevented the set-up and use of the fish fence, a traditional Shageluk Deg Hitan cultural community tradition and event. None of our high school students have had the opportunity to participate in this ancient fishing tradition that may become a lost art and practice. The trend toward warmer temperatures and less precipitation indicate that fires are likely to increase over time and will change the way we, the plants and animals of our land will live. Long-term data that includes long-term community knowledge is essential to any future cultural and subsistence planning for us.

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**School:** Kingsburg High School, Kingsburg, California

*Monday 23 June, 13:30-15:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** Troposphere Ozone Levels and Respiratory Health of Students at Kingsburg High School

**Abstract:** Although stratospheric ozone protects us from harmful ultraviolet radiation, ozone is a threat to human health in the troposphere and has been linked to asthma and other respiratory ailments. More than one in five children in the San Joaquin Valley, California, has asthma, the highest rate in the United States (*Fighting For Air* 2007).

The geography, climate, and conditions in our valley provide a perfect formula for ozone production: industrial air pollutants, high traffic flow, trapped air due to mountains surrounding the valley, an inversion layer that traps the air from above, and long hot summers with little rainfall allowing photochemical interactions among the pollutants producing ozone. The San Joaquin Valley has recorded record levels of tropospheric ozone for many years. Kingsburg High School's (KHS) campus is located near a major freeway and bordered by busy roads.

The goals of this project were to measure the amounts of ozone to which students are exposed at school, and to survey KHS students to find out the incidence of asthma and related factors that might correlate to higher or lower rates of asthma.

We hypothesized that ozone levels on campus would be highest outdoors and in parking lot areas. Outdoor ozone levels were much higher than indoor levels, but parking lots did not always have higher levels than other outdoor areas.



Survey results revealed a weak correlation between how long students were diagnosed with asthma compared to how long they had been living in Kingsburg (in hindsight we should have asked how long they lived in the Valley). A positive relationship was found between the number of sports a student participated in and whether or not they had asthma. There was a stronger positive relationship between number of students with asthma who had a family history of asthma.

A preliminary study to explore ozone’s affect on our local agriculture was carried out to measure leaf deterioration and ozone levels in grape vines near high-traffic roadways compared to grape vines far from roadways. This study will be completed this summer.

The final goal was to compare school ozone levels and respiratory health of KHS students with the same variables from a GLOBE school in Wetzlar, Germany. We will compare our findings at the conference.

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**School:** Pine Elementary/Junior High School, Pine, Idaho

**Title:** Did Either the Fish Weir or the Controlled Burn Effect the Health of our River?

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2C, Leslie Hall*

**Abstract:** Two major events occurred within a very short distance of each other on the South Fork of the Boise River this past year: A fish weir was installed on a concrete sill in the riverbed and a controlled burn was conducted alongside the river. These two events led us to ask the following question. Did either the controlled burn along the river or the construction of the fish weir affect the health of our river? We have been conducting a comparison study among three sites along the South Fork Boise River. We have taken samples above the fish weir, below the fish weir, and after the controlled burn area. (Figure 1) We looked for changes in the water that might have been caused by the construction of the fish weir and the controlled burn. We collected and documented GLOBE data between March and May 2007. Although we found slight differences in conductivity and turbidity, we concluded that neither the construction of the fish weir or the controlled burn affected the river in a negative way.

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**School:** Indiana School For The Deaf, Indianapolis, Indiana, and Model Secondary School for the Deaf, Washington, D.C.

**Title:** A Comparison of Green Up in Two Locations at Similar Latitudes: Indiana and Washington, D.C.

*Tuesday 24 June, 13:30-15:00 Session,  
Room #LS2D, Leslie Hall*

**Abstract:** This report is a collaborative research project conducted during the spring of 2007. We are a team of four students representing the students in Earth System Science classes at the Model Secondary School for the Deaf in Washington, DC and Earth Science classes at the Indiana School for the Deaf in Indianapolis, Indiana.

Our project focused on answering the following questions:

- 1) Is there a difference in tree phenology with regard to spring budding in our two schools?
- 2) What environmental factor is (or factors are) controlling the timing of budburst in our areas?

We collected data using GLOBE’s Green Up protocol. In Indiana, we used the GLOBE protocols for recording precipitation, minimum temperatures, and maximum temperatures at a GLOBE weather station. In Washington, DC, we obtained temperature, humidity, and precipitation data from a Davis Advantage Pro automatic weather station. At both schools, we studied Silver Maple (*Acer saccharinum*) and CrabApple (*Pyrus coronaria*) trees. To complete our research project, we used the Internet and videoconferencing to discuss data, compare results, determine conclusions, and write a final report .Before we started collecting data at each school, we looked for information about budburst. Much of the information we found, said that both temperature and moisture could influence budburst. We compared the geographic locations of our two schools. Our hypothesis was that the tree buds in Washington, DC would burst before Indiana’s because there would be more water in the air closer to the ocean, and that the water would control the timing of budburst more than temperature. At the end of our project, we noted differences in precipitation and temperature in our two different geographic locations. We found patterns in the data as spring season progressed which indicated that temperature may have been more important than moisture in the budburst of our trees. We noted the biological responses of the trees to changes in the environment. We agree that the trees’ responses are important to understand in order to predict what will happen to trees if our climate changes.

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**School:** Center School District #58, Missouri

*Tuesday 24 June, 10:30-12:00 Session,  
Room #LS2B, Leslie Hall*

**Title:** Climate and its Effect on West Nile Virus Distribution and Prevention

**Abstract:** Using GLOBE data, the student researchers investigated the relationship between precipitation, humidity, temperature and the frequency of West Nile virus. Only cities within certain latitudinal parameters were examined. The temperature was a key factor in the development of West Nile virus while precipitation appeared to be an indirect factor.

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**School:** Roswell Kent Middle School, Akron, Ohio

*Monday 23 June, 13:30-15:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** This is Why I'm Hot

**Abstract:** Our project is about surface temperature and how the amount and albedo (reflectivity) of asphalt in an area affects the temperature of surrounding short-grass areas. We did this because our teacher was complaining that in the rural area in which he lives, there tends to be more snow days than the urban area where we live. We wanted to know why this is. We contacted other schools and took short-grass temperature data and recorded them on the GLOBE website for five consecutive days. Next, we graphed the data for the five days' temperatures taken. Finally, we compared the difference in the surface temperatures of short-grass sites in rural areas with the urban sites. We found the data we received supported our hypothesis, in part, the last two of the five days. Urban areas retained heat longer than rural areas. Our research results suggest an extended study is needed.

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**School:** Ramey School, Ramey, Puerto Rico

*Monday 23 June, 10:30-12:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** The Effect of Leaf Mulch on Soil Moisture and Soil Temperature in the Tropics

**Abstract:** The research topic was how leaf mulch affects the soil temperature and the soilmoisture in the gardens in the tropics. Our designed an experiment that consisted of threegardens beds of one by three meters, one with no mulch, one with three ches of mulch and one with six inches of mulch. We followed the GLOBE soil moisture and temperature protocols. For three months the team gathered the soil temper research team.

In nature and five to ten centimeter soil moisture samples, the amount of rainfall, the soil moisture content as well as records of plant environment and growth conditions of the beds with the different levels of mulch. With the data collected to make suitable graphs, the team was able to infer that the garden beds with mulch allowed the conservation of water, lower soil temperatures and the depletion of weeds, despite the elements. Mulch decreases the soil moisture lost to the environment which conserves water and maintains a lower range of temperature variation in which plants can be grown.

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**School:** St. Paul High School, Virginia

*Monday 23 June, 13:30-15:00 Session,  
Room #LS3B, Leslie Hall*

**Title:** WATER Along the Clinch River using GLOBE

**Abstract:** St. Paul High School (St. Paul, VA – U.S.A.) has been a member of GLOBE since 2001. We are dedicated to improving our environment one student and one school at a time. Members of Team Estonoa and science students at SPHS conduct hydrology monitoring at three different sites on the Clinch River and the water of Wetlands Estonoa once a week. The Clinch River is considered one of the most biodiverse rivers in North America. GLOBE weather is done daily at the St. Paul Elementary School. Both data are entered on GLOBE's web site to be used worldwide. To expand our GLOBE project, St. Paul High School initiated the WATER (Waters of the Appalachia Tested and Reviewed) Project, funded by the Virginia Department of Education. Through the WATER Project, St. Paul High School annually partners with seven other area schools for the training, collection, and analysis of hydrology data. Our WATER project is developing a state model for service learning, with the goal of enriching the science curriculum by providing training and support to conduct hydrology testing on local streams and rivers. GLOBE training sessions are conducted for teachers who work along the Clinch River or its tributaries.



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### Lebanon

Codsi, Renee, American Community School at Beirut  
Halaby, Lamice, American Community School at Beirut  
Kerbaj, Rita, American Community School at Beirut  
Maalouf, Woody, American Community School at Beirut  
Mayo, Jeffrey, American Community School at Beirut  
Moneimne, Hamoudi, American Community School at Beirut  
Moneimne, Youssef, American Community School at Beirut  
Naylor, Samuel, American Community School at Beirut  
Saad, Farah, American Community School at Beirut  
Saoud, Else, American Community School at Beirut  
Yaghi, Mohamad, American Community School at Beirut

### Lithuania

Asociakov, Sergej, Lithuanian Center of Young Naturalists  
Gaidiene, Rasa, Troskunu Secondary School  
Jakovlevaite, Egle, Kursenu L.Ivinskio Gymnazium  
Rimkute, Irena, Lithuanian Center of Young Naturalists  
Rugieniute, Justina, Troskunu Secondary School

### Madagascar

Randrianarisoa, Paul, Ministère de l'Éducation Nationale et de la Recherche Scientifique

### Mali

Adama, TRAORE Moussa, Ministère de l'Éducation de Base, de l'Alphabétisation et des Langues Nation

### Namibia

Sampson, David Moos, Ministry of Education

### Netherlands

Asseldonk, Martien Van, College De Heemlanden  
Baeten, Ilse Guillaumine, Sint-Maartenscollege  
Beaulen, Gaston Henricus, Sint-Maartenscollege  
Begheyn, Matthijs, Sme Advies  
Bell, Saskia Leonie, Sint-Maartenscollege  
Boumans, Veronica Elisabeth, Sint-Maartenscollege  
De Jong, Chris Arnoldus, Sint-Maartenscollege  
Delvigne, Vincent, College De Heemlanden  
Frambach, Gerardus Joseph, Sint-Maartenscollege  
Freens, Oscar Rene, Sint-Maartenscollege  
God, Yannick Jo, Sint-Maartenscollege  
Gortzen, John Jozef, Sint-Maartenscollege  
Hecker, Joep, Sint-Maartenscollege  
Heckers, Monique Helene, Sint-Maartenscollege  
Heuschen, Caroline Brigitte, Sint-Maartenscollege  
Heutz, Jolanda Hubertina, Sint-Maartenscollege  
Hofstra, Anna, Sint-Maartenscollege  
Hogenboom, Laura, Sint-Maartenscollege  
Janssen, Davine Leonardus, Sint-Maartenscollege  
Kon, Ruben Olivier, Sint-Maartenscollege  
Kyll, Fauve, Sint-Maartenscollege  
Langen, Jordi, College De Heemlanden  
Linssen, Aniek Maria, Sint-Maartenscollege  
Linssen, Menno Julius, Sint-Maartenscollege  
Nezami, Saleha, Sint-Maartenscollege  
Ouweland, Tom, College De Heemlanden  
Post, Elias Antonia, Sint-Maartenscollege  
Put, Daan Van, College De Heemlanden  
Reinders, Lisa Catharina, Sint-Maartenscollege  
Rings, Johannes Mathias, Sint-Maartenscollege  
Rodov, Anthony, Sint-Maartenscollege  
Snoeij, Jan Pieter, College De Heemlanden  
Stassen, Max Joseph, Sint-Maartenscollege  
Struijker Boudier, Samuel Ludovic, Sint-Maartenscollege  
Van Asten, Robertus Franciscus, Sint-Maartenscollege  
Van Bunningen, Arnoldus Jacobus, Sint-Maartenscollege  
Van den Broek, Lynn Maria, Sint-Maartenscollege  
Van den Eijnden, At Jakob, Sint-Maartenscollege  
Van der Spoel, Mark Willem, Sint-Maartenscollege  
Van der Woude, Pieter Petrus, Sint-Maartenscollege  
Van Iterson, Margaretha Wilhelmina, Sint-Maartenscollege  
Van Kempen, Wilhelmus Petronella, Sint-Maartenscollege  
Van Kraaij, Sebastiaan Jan, Sint-Maartenscollege  
Warnier, Raymond, Sint-Maartenscollege  
Wilbers, Bas, College De Heemlanden  
Willems, Stacey Joani, Sint-Maartenscollege



Wooning, Jacqueline, College De Heemlanden  
Zhu, Dani Jing, Sint-Maartenscollege

### **New Zealand**

Goffin, Rebecca, Royal Society of New Zealand

### **Niger**

Garba, Mahazou, Cellule pour le Généralisation et  
Pérennisation de l'Éducation Environnementale

### **Nigeria**

Korie, Eberechukwu Ernest, Federal Ministry of Education

### **Norway**

Alvestad, Aase, Bodø Videregående Skole  
Anthonsen, Ingrid Schroeder, Bodø Videregående Skole  
Boe, Inger Solveig, Vang Barne- og Ungdomsskule  
Eidsvaag, Ingrid Andersen, Bergen Katedralskole  
Hallaraaker Utvaer, Liv Sofie, Fyllingsdalen Videregående  
Skole  
Heimlid, Jon, Vang Barne- og Ungdomsskule  
Hetland, Karl Torstein, GLOBE Norway  
Holsmo, Marianne, Bodø Videregående Skole  
Iversen, Kristine, Bodø Videregående Skole  
Jaegersborg, Ottar, Vang Barne- og Ungdomsskule  
Johansen, Roger, Bodø Videregående Skole  
Landstad, Astrid Staaedotter, Bodø Videregående Skole  
Litland, Geir, Bergen Katedralskole  
Rogn, Lene, Vang Barne- og Ungdomsskule  
Soendrol, Camilla, Vang Barne- og Ungdomsskule  
Thorshaug, Mathias, Bodø Videregående Skole

### **Poland**

Balchan, Michal, Gimnasium no 9  
Chmiel, Adrianna, Gimnasium no 9  
Dudek, Paulina, Gimnasium no 9  
Jankowski, Jerzy, Complex of Secondary Schools in  
Przysucha  
Mirek, Kaja, Gimnasium no 9  
Musial, Aleksandra, Gimnasium no 9  
Rybiński, Michał, Complex of Secondary Schools in  
Przysucha  
Stafiej, Sebastian, Gimnasium no 9  
Zamorski, Jakub, Gimnasium no 9

### **Puerto Rico**

Guillemard, Luisa, University of Puerto Rico, Mayaguez  
Mercado, Samirah, University of Puerto Rico, Mayaguez

### **Qatar**

Alsaadi, Ahlam, Alshaima Secondary School for girls-Qatar

### **Rwanda**

Ntivuguruzwa, Celstin, Kigali Institute of Education

### **Saudi Arabia**

Algarni, Waleed M., Educational Ministry Of Saudi Arabia  
Al-Falih, Abdullah Msaad, King Saud University  
Jambi, Rafat Ali, Ministry of Education K.S.A

### **Senegal**

Ba, Mamadou, Lycée Seydina Limamoulaye  
Fal, Diarafal, Globe of Lycée Blaise Diagne  
Fall, Ngosse Bousso, Lycée Seydina Limamoulaye

### **South Africa**

Awiwe, Lungwana, Indwe Secondary School  
Bessie, Neville, St. Pauls Primary  
Blankenberg, Monray, Kretzenshoop Primer  
Botha, Jaron, Conville Primary  
Botha, Lorrian, St. Pauls Primary  
Botha, Sandra, Rosemoor Primary  
Brettenny, Mark Anthony, GIA ERD&T  
Brettenny, Rogeline Christine, GIA ERD&T  
Bridgeman, Jenny, Western Cape Education Department  
Bruinders, Arthur, Parkdene Primary  
Bruinders, Kerswin, Parkdene Primary  
Bydels, Zenobia, Parkdene Primer  
Campher, Thursia, Kretzenshoop Primary  
Carelse, Charles, Heidedal Primer  
Chopisa, Nkosimandla, Indwe Secondary School  
Claassen, John, Conville Primer  
Conradie, Rowan, Heidedal Primary  
Cunningham, Thorn, Parkdene Primary  
Cussons, Eugene, Chimp Eden  
Davids, Zoe, Nature Conservation  
Du Preez, Hester, Kretzenshoop Primary  
Du Preez, Jesnique, Diepkloof Primer  
Du Preez, Rowan, Hibernia Primary  
Du Preez, Wally, Hibernia Primer  
Ehrenreich, Dawn Theresa, Edith Stephens Wetland Park,  
Nature Conservation  
Ferendale, Christo, Diepkloof Primer  
Fourie, Stefanus, Conville Primer  
Frans, William, Conville Primer  
Gayo, Sibogiseni, Indwe Secondary School



Gcina, Phemexolo, Grahamstown  
 Green, David, Western Cape Education Department  
 Heskwa, Petronice, Rosemoor Primary  
 Hoffmeester, Daniel, Conville Primary  
 Hoogbaard, Jason, Delville Park Primer  
 Jacobs, Leroy, Parkdene Primer  
 James, Alison, Indwe Secondary School  
 Jantjies, Nadine, Rosemoor Primary  
 Joubert, Erizana, Kretzenshoop Primary  
 Julius, Candice, Delville Park Primer  
 Julius, Vernon, GIA ERD&T  
 Juries, Joelene, Western Cape Education Department  
 Kirkland, Nicholas, Grahamstown  
 Knott, Liesl Kathleen, Zoology Department, Rhodes University; Grahamstown  
 Lebaka, Siphwiwe, Indwe Secondary School  
 Lerato, Indwe Secondary School  
 Levendal, Farren, Hibernia Primary  
 London, Shure, Kretzenshoop Primary  
 Lottering, Grant, Hibernia Primer  
 Makan, Elroy, Delville Park Primary  
 Mamzezulu, Mzi, Western Cape Education Department  
 Mbanga, Zolani, Heidedal Primer  
 Mbeta, Lucy, GLOBE Africa  
 Michaels, Stacy-Anne, City of Cape Town Nature Conservation  
 Mokoena, Sibongile, South African Environmental Observation Network  
 Mpinda, Sithle, Indwe Secondary School  
 Mqweba, Sisipho, Diepkloof Primer  
 Mtontsi, Thomas, South African Environmental Observation Network  
 Muller, Fabian, Diepkloof Primer  
 Muller, Jermain, Diepkloof Primer  
 Nieweveldt, Rhona, Conville Primer  
 Nosib, Paige, Grahamstown  
 Nwabisa, Skofsha, Indwe Secondary School  
 Olwethu, Indwe Secondary School  
 Pick, Trudell, St. Pauls Primary  
 Prins, Haylee Anne, Rosemoor Primer  
 Rampou, Sueanne, Western Cape Education Department  
 Ruiters, Joanalle, St. Pauls Primary  
 Scholtz, Myrna Ingrid, Edith Stephens Wetland Park (CoCT)  
 September, Enerize, St. Pauls Primary  
 Sibiya, Ready Joe, South African Environmental Observation Network  
 Southgate, Nicole Andrea, City of Cape Town Nature Conservation  
 Spies, Lee-Maine, Hibernia Primer

Stephenson, Ryan, Grahamstown  
 Stuma, Mandisi, Grahamstown  
 Tafadzwa, Mafuma, Grahamstown  
 Tesnar, Anchea, Grahamstown  
 Tshingana, Dumile, South African Environmental Observation Network  
 van Rooyen, Abigail, Heidedal Primer  
 Vermeulen, Bryone Marshalene, City of Cape Town Nature Conservation  
 Volkwyn, Chante, Rosemoor Primary  
 Watkins, Zane, Grahamstown  
 Williams, Muagelain, Heidedal Primary

### **Spain**

Andres, Clemencia, CRIF Las Acacias, Council of Education  
 Castillo, Jaime Jesus, IES Federico Garcia Lorca  
 Lopez, Concepcion, IES Federico Garcia Lorca  
 Martin, Jorge, IES Federico Garcia Lorca

### **Sri Lanka**

Rathnayake, Malinda Prasad, Maliyadeva College

### **Switzerland**

Meier, Hanspeter, CC GLOBE Switzerland

### **Tanzania**

Kivaria, Mary Gaspar, Ministry of Education  
 Lwikolela, Robert E.M., Ministry of Education and Vocational Training  
 Magehema, Joseph Athman, Kibaha Sekondary School  
 Mmuya, Kaspar Kaspar, Kibaha Secondary School  
 Moshi, Edward Exaud, Kibaha Secondary School  
 Musaroche, Leonard P.R, Ministry of Education and Vocational Training  
 Mushi, Paul S.D., Tanzania Institute of Education

### **Thailand**

Aiumtrakul, Jirakul, Dara Academy  
 Boonkrote, Patcharida, Dara Academy  
 Chaisorn, Thitiya, Roong-aroon School  
 Chanakijserre, Pichaya, Roong-aroon School  
 Grunneck, Lucsame, Dara Academy  
 Kanthiya, Phawinee, Dara Academy  
 Luecha, Jannapha, Dara Academy  
 Mongkonthan, Suwinai -, The Institute for the Promotion of Teaching Science and Technology (IPST)  
 Navanugraha, Charlie, The Institute for the Promotion of Teaching Science and Technology (IPST)



Niwetworakarn, Nattanun, Dara Academy  
 Pongcharoenyon, Thana, Roong-aroon School  
 Pusingha, Patrawut, The Institute for the Promotion of Teaching Science and Technology (IPST)  
 Ruairuen, Watcharee, The Institute for the Promotion of Teaching Science and Technology (IPST)  
 Sayabutra, Narumon, Dara Academy  
 Sirisujin, Manoonvatana, Dara Academy  
 Suchareekul, Jariya, The Institute for the Promotion of Teaching Science and Technology (IPST)  
 Suteekha, Karuna, Dara Academy

### **Trinidad and Tobago**

Alves, Carli , Brazil High School  
 Francis, Nicholas, Brazil High School  
 Kameel, Mohammed-Ali, Brazil High School  
 Saunders, Henry Henderson, GLOBE Country Coordinator

### **Uganda**

Samuel, Sempala Patrick, Ministry of Education and Sports

### **United States**

Bagayoko, Diola, Southern University and A&M College  
 Baldi, Justin L., Model Secondary School for the Deaf  
 Bangar, Kiranjit K., Kingsburg High School  
 Boardwine, Ashley Nicole, St. Paul High School  
 Boger, Rebecca, Brooklyn College  
 Carlson, Chelsey B., Kingsburg High School  
 Cartwright, Tina J., Marshall University  
 Clarke, Karl C, University Corporation for Atmospheric Research/GLOBE Program Office/SOARS  
 Cobbs, Georgia Ann, The University of Montana  
 Cole, Sarah, Center Middle School  
 Coren, Ann L, Earth Science Division/SMD/NASA  
 Crace, Tyler F., Indiana School for the Deaf  
 Ellsworth, Mary Susan, Model Secondary School for the Deaf  
 Ensign, Todd, NASA IV&V Facility Educator Resource Center  
 Falcon, Peter C., JPL/NASA  
 Falls, Ashley Lynn, Roswell Kent Middle School  
 Farrow, Tori M, Motor City Model UN Club  
 Farrow, Winston B, Motor City Model UN Club  
 Fenzel, Matthew Squires, GLOBE Alumni  
 Fish, Susan D., The Pine School  
 Foletta, Peggy, Kingsburg High School  
 Ford, Robert L, Texas Southern University  
 Frantz, Steven L., Roswell Kent Middle School

Freer, Malcolm I., The Pine School  
 Freer, Michael, The Pine School  
 Freer, Sheri, The Pine School  
 Frenchik, James Anthony, Indiana School for the Deaf  
 Frenzel, Cynthia, Friends of the North Fork of the Shenandoah River  
 Frenzel, Erin, W. W. Robinson Elementary School  
 Frenzel, Jessica, Peter Muhlenburg Middle School  
 Frenzel, Paul, Virginia Dept. of Game and Inland Fisheries  
 Geary, Christopher Ian, Boulder High School  
 Geary, Edward E, GLOBE Program Office  
 Gilman, Peter, National Center for Atmospheric Research  
 Goehring, Liz, Penn State University  
 Goldwasser, Michelle, Center Middle School  
 Goldwasser, Ori, Center Middle School  
 Halasa, Katrina Bassam, Akron Public Schools  
 Hamilton, Jamie L., Innoko River School  
 Hamilton, Joyanne, Innoko River School  
 Hamilton, Rudolph G., Innoko River School  
 Hehr, John George, University of Arkansas  
 Hehr, Lynne Harris, University of Arkansas  
 Heiderer, Janet K., GLOBE Program Office  
 Hemler, Debra, Fairmont State University  
 Herrera-Ruberte, Emmanuel Jose, Ramey School  
 Hoffman, Martos, GLOBE Program Office  
 Hogue, Anthony, Center Middle School  
 Hope, Jeardon Marie, Ramey School  
 Hope, Natasha Cherese, Ramey School  
 Horejsi, Martin Gerard, The University of Montana  
 Huckleberry, Teresa Lee, Indiana School for the Deaf  
 Hufford, Charles Joseph, The Pine School (Elementary)  
 Hufford, Pennie L., The Pine School  
 Jefferys, Katelyn S., Roswell Kent Middle School  
 Jensen, Jordan, Center Middle School  
 John, Jack J., Innoko River School  
 Johnson, Darian, Center Middle School  
 Johnson, Robyn, Vernier Software & Technology  
 Jona, Kemi, Northwestern University  
 Jona, Orli, Central School  
 Karsten, Jill, US National Science Foundation  
 Kaye, Jack, NASA Headquarters  
 Kennedy, Teresa J, GLOBE Program Office  
 Klett, Mitchell, Northern Michigan University  
 Lackey, Katherine Wogan, GLOBE Program Office  
 Larsen, James L, GLOBE Program Office  
 LeMone, Margaret Anne, GLOBE Program Office/National Center for Atmospheric Research



Leon, Mike, GLOBE Program Office  
 Low, Rusty, GLOBE Program Office  
 Martinez, Xavier Alexander, Ramey School  
 McClurg, Nandini (Nan), GLOBE Program Office  
 McMann, Arnold, Center Middle School  
 McMann, Conor, Center Middle School  
 Merrill, Melinda, Center Middle School  
 Moore, Michael Girard, National Aeronautics and Space Administration  
 Moyer, Julia S., Roswell Kent Middle School  
 Musick, Megan, St. Paul High School  
 Noll, Cindy, Center Middle School  
 Noll, Madison, Center Middle School  
 Odell, Michael R.L., University of Texas at Tyler  
 Opt, Susan, Salem College  
 Patterson, Lateefah, Model Secondary School for the Deaf  
 Por, Melanie, Kingsburg High School  
 Price, Elizabeth K., Roswell Kent Middle School  
 Quinn, Loretta, GLOBE Program Office  
 Randolph, Gary, GLOBE Program Office  
 Reysenbach, Anna-Louise, Portland State University  
 Rhoads, Emily Teagan, The Pine School  
 Robinson, Paula M., GLOBE Program Office  
 Roettger Moreda, Richard Alberto, Ramey School  
 Roettger, Richard Hugh, Ramey School  
 Sadler, Stephen Clyde, University Corporation for Atmospheric Research  
 Self, Joshua E., Indiana School for the Deaf  
 Semone, Everett W., Innoko River School  
 Sharp, Kasey Jack, The Pine School  
 Sharp, Kristi, The Pine School  
 Silverberg, Judith, New Hampshire Fish and Game  
 Silverberg, Sarah K, University of New Hampshire  
 Sisk, Deborah, Center Middle School  
 Smith, Andrew S, Chester Senior High  
 Smith, David, GLOBE Program Office  
 Smith, Kelly, GLOBE Program Office  
 Smith, Sarah F, University of North Carolina at Charlotte  
 Sohal, Kanchanpreet K, Kingsburg High School  
 Soltis, Beth L, Boulder High School  
 Sparrow, Elena Bautista, International Arctic Research Center  
 Staples, Kimberly A., Kansas State University  
 Steliga, Jason, Center Middle School  
 Stonebraker, Eric, GLOBE Program Office  
 Thomas-Jefferson, Emmanuel, Motor City Model UN Club  
 Vane, Michael West, ABW Productions  
 Wade, Elizabeth Ann, St. Paul High School  
 Wei, Ming-Ying, Earth Science Division, NASA  
 Wessman, Kelsey M., Model Secondary School for the Deaf  
 Williams, Mosheh VJ, Motor City Model UN Club  
 Williams, Vernon J, Motor City Model UN Club  
 Willis, Marsha J, University of Texas at Austin, TRC  
 Wright, Abigail, Rolling Ridge Elementary School  
 Wright, Andrew, Oregon Trail Junior High School  
 Wright, Ashley, Oregon Trail Junior High School  
 Wright, David, Shawnee Mission South High School  
 Wright, Emmett, GLOBE Program Office  
 Wright, Mary Jane, GLOBE Program Office  
 Young Jr., Keith, Motor City Model UN Club  
 Young Sr., Keith, Motor City Model UN Club  
 Young, Amber, Motor City Model UN Club  
 Young, Briana Nicole, Motor City Model UN Club  
 Yule, Sheila, GLOBE Program Office

# GLOBE LEARNING EXPEDITION

## GENERAL INFORMATION AND LOGISTICS

Your “PASSPORT” to the GLE is your nametag/lanyard! Wear it at all times during the conference - you will need it for identification, meals and transportation at all GLE related events.

### **GLE Registration locations and hours:**

Friday, 19 June, 10:00-16:00, Graca Machel dormitory lobby  
Saturday, 20 June, 9:00 - 18:00, Molly Blackburn Gathering Hall  
Sunday, 21 June, 8:00 - 12:30, Molly Blackburn Gathering Hall

### **Travel and Information Desk**

The Travel and Information Desk will be open from 08:00 - 18:00 from the 21st to 28th June 2008. From the 21st - 27th the desk will be in Molly Blackburn Hall. On the 28th June, the desk will move to Graca Machel residence.

**GLE Presentations:** Be sure to have your presentation submitted to Tribal Meetings no later than 14:00 on Sunday, 22, June. You can email your presentation to [globe@tribalmeetings.co.za](mailto:globe@tribalmeetings.co.za)

**Presentation Practice Session:** Delegation will be given the opportunity to practice their presentations on Sunday morning. Please sign up during registration to book your slot.

### **Pre conference meetings:**

Prior to the opening ceremony, there will be a mandatory briefing for all participants regarding safety and logistics during the week.

*Students and Chaperones:* Sunday, 22 June 14:00 - 15:00, Safety briefing, Leslie Hall

*Chaperones and Group Leaders:* Sunday, 22 June 15:00 - 15:30, Safety briefing, Leslie Hall

**Computer Lab:** Students may use computers and access the internet in the Alumni Lab, Leslie Commerce Building. The lab will be open beginning 20 June. Exact hours of availability will be posted each day. The computer lab will be closed during all plenary and breakout sessions.

**Country Exhibits:** Leslie Social Science Bldg. Foyer

Exhibit space will be available to you beginning Saturday, 21 June and through Sunday, 22 June. Exhibits should be cleared at the close of the day on 24 June.

**Meals:** Breakfast, lunch and dinner will be provided during the GLE beginning with dinner Saturday, 21 June through Breakfast Saturday, 28 June. See detailed agenda for more information. Please do not take food or drink in the lecture venues at Leslie Social Science Center. There is a coffee/snack shop in Molly Blackburn Gathering Hall (cash only, South African Rand).

**ATM:** An Automatic Teller Machine (Bankomat) dispensing South African Rand is located in Leslie Social Science Building. The ATM will accept most debit and Visa cards with PIN. There is no facility on campus for changing foreign currency into South African Rand.

South African Rand will be needed to make purchases at the field day craft market at CPUT (North Field Sites), at the Cape Point tourist center (South Field Sites), and at campus snack outlets.

**Phone cards:** World Call cards enable delegates to call all over the world from any one of the public telephones. Delegates can buy World Call cards at the Post Office at University of Cape Town. Please check your University of Cape Town map to locate the Post Office or check with one of the Assistants.

**Telephones**

There are many telephones located on University of Cape Town campus. In Leslie Social Sciences Building telephones are located on the 1st level. Beside the Post Office, within short walking distance, more telephones can be found. Telephones can also be found at the Jammie Shuttle pick-up point on Lower Campus within easy walking distance of Graca Machel Residence. Please check with one of the Assistants to find the closest telephone.

**Field study days:** Wednesday, 25 June and Thursday, 26 June

Be prepared! Wear sturdy shoes, and warm clothing, and bring a waterproof rain jacket or poncho. Air temperature near the oceans can be much cooler than inland locations.

Water: **fill** your water bottle before leaving Graca Machel Dormitory in the morning.

Food: lunch will be provided on both field days.

Special note regarding the Cape Point Field Site: Do not leave food unattended! There are baboons in the area. Baboons are dangerous and are attracted by food.

Bring some South African Rand for the market at CPUT and Cape Point tourist center.

**Laundry:** A laundry / Dry Cleaning service will be available to delegates staying at Graca Machel Residence from arrival to departure. All rooms will have a laundry bag and laundry slip, which delegates need to complete if they require the service. Delegates need to bring their laundry bags to the laundry desk before 09:30 each morning for collection. Clothes will be returned before 18:00 on the same day. Payment needs to be made directly to the Laundry Service Provider, which can be done when the clothes are returned.

**Transportation:**

Shuttle service will be provided during the meeting via specially reserved University of Cape Town shuttle. Transport between the Graca Machel dormitory and the Upper Campus meeting locations will be scheduled according to the agenda. Additional shuttle times will be posted in the Graca Machel dormitory and at the meeting locations. A University of Cape Town campus map will be provided in your registration packet on-site.

Transportation to and from off-campus GLE events, field study days and closing banquet will be provided by coach, according to the schedule in the agenda.

Taxi service is available from off-site lodging; please consult the concierge at your hotel.

**Travel and Tours Desk:** Molly Blackburn Gathering Hall

Please visit the travel and tours desk to confirm your airport transfers times/needs, confirm your return air travel flight, request assistance with lost luggage, etc., and purchase and schedule local tours for after the conclusion of the GLE.

**Medical facilities:**

A doctor is available on-site for delegates who require medical attention. Please consult with one of the staff members to assist you with any medical concerns.

**Gala Dinner:** - Friday 27 June - MOYO, Stellenbosch

Transportation will be provided for GLE participants from University of Cape Town Campus to and from the Gala Closing Banquet.

**Cell Phones:** Please be sure to silence your cell phones during all conference sessions.



## FIELD STUDY SITES

### TABLE MOUNTAIN NATIONAL PARK

Situated at the junction of two of earth's most contrasting water masses – the cold Benguela current on the West Coast and the warm Agulhas current on the East Coast, the Cape of Good Hope is popularly perceived as the meeting point of the Atlantic and Indian oceans. Geographically, however, the Indian Ocean joins the Atlantic Ocean at Cape Agulhas National Park.

The local authority proclaimed the area a nature reserve in 1938 and it was incorporated into the Cape Peninsula National Park in 1998. In 2004 the name changed to Table Mountain National Park. It encompasses 7750 hectares of rich and varied flora and fauna and its 40 kilometre coastline stretches from Schuster's Bay in the west to Smitswinkel Bay in the east.

The cliffs at the southern point, towering more than 200 metres above the sea, consist of three clearly define promontories – Cape of Good Hope, Cape Maclear and Cape Point.



### LOCAL FLORA

The Cape of Good Hope is an integral part of the Cape Floristic Kingdom, the smallest but richest of the world's six floral kingdoms.

This comprises a treasure trove of 1100 species of indigenous plants, of which a number are endemic (occur naturally nowhere else on earth). Two types of fynbos ("fine bush"), coastal fynbos on alkaline sands and inland fynbos on acid soils, are found.



Characteristic fynbos plants include proteas, ericas (heath) and restios (reeds). Some of the most striking and well-known members belong to the Proteaceae family, of which up to 24 species occur. These include King Protea, Sugarbush, Tree Pincushion and Golden Cone Bush.

Many popular horticultural plants like pelargoniums, freesias, daisies, lilies and irises also have their origins in fynbos.

### LOCAL FAUNA

With its diverse habitats, ranging from rocky mountain tops to beaches and open sea, the Cape of Good Hope is home to at least 250 species of birds. "Bush birds" tend to be rather scarce because of the coarse, scrubby nature of fynbos vegetation. When flowering however, proteas and ericas attract sunbirds, sugarbirds and other species in search of nectar. For most of the year, there are more small birds in coastal thicket than in fynbos.



Large animals are a rare site in the Cape of Good Hope, but there are a wealth of small animals such as lizards, snakes, tortoises and insects. There are some herds of Zebra, Eland and a variety of other antelope. Small mammals also include Rock Hyrax ("dassie"), Striped Mouse, Water Mongoose and Cape Clawless Otter.



The area offers excellent vantage points of whale viewing. The Southern Right Whale is the species most likely to be seen in False Bay between June and November. Other species are the Humpback Whale and Bryde's Whale. Seals and Dolphins may also be seen.

The strategic position of the Cape of Good Hope between two major ocean currents, ensures a rich diversity of marine life. There is a difference between the sea life west of Cape Point and that to the east due to the markedly differing sea temperatures.



### EDITH STEPHENS WETLANDS PARK

Edith Stephens Wetland Park: it is a pocket of natural vegetation in the middle of the built-up area of Manenberg and Philippi. It is a haven for many plant, animal and bird species. These include an ancient fern, *Isoetes capensis*, that is found only in the Cape Flats.

The term Cape Flats refers to a flat, sandy stretch of land that is located on the outskirts of the city of Cape Town.

### TYGERBERG NATURE PRESERVE

The preserve offers a breathtaking 360° view of CAPE Peninsula and borders the best wine lands in the Western Cape, due to the soil composition and quality. The featured study will be of the highly endangered Fynbos [fainbas] meaning “fine bush” in Afrikaans. Fynbos is the natural shrub land or heath land vegetation occurring in a small belt of the Western Cape of South Africa, mainly in winter rainfall coastal and mountainous areas with a Mediterranean climate.



### SOUTH AFRICAN WEATHER SERVICE GLOBE ATMOSPHERE WATCH STATION (GAWS)

This GAWS station is one of the World Meteorological Organization's 20 Global Atmosphere Watch (GAW) stations. It monitors environmentally important air components, including trace gases like ozone, methane, carbon dioxide, as well as solar radiation and various meteorological parameters.

The air at Cape Point is regarded as being particularly pure for most of the time, thereby providing insights into such crucial phenomena as stratospheric ozone depletions and climate change.

### CAPE PENINSULA UNIVERSITY OF TECHNOLOGY

CPUT's mission is to develop and sustain an empowering environment where, through teaching, learning, research and scholarship our students and staff, in partnership with the community and industry, are able to create and apply knowledge that contributes to development.



# GLOBE EARTH SYSTEM SCIENCE PROJECTS (ESSPS)

## Seasons and Biomes

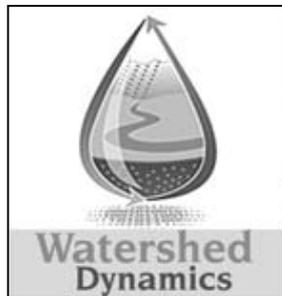
A biome is a large geographic area of distinctive plant and animal groups that are adapted specifically for a particular environment. Biome type is determined by the climate and geography of a region. Through the GLOBE Seasons and Biomes project, students and teachers will have the opportunity to use GLOBE resources and support to conduct scientific inquiries in their local environments and biomes.

This project will contribute critically needed science measurements to validate satellite data used in research on regional climate change, prevention and management of diseases, and understanding of the water and carbon cycles. By monitoring the seasons in your biome, you will learn how interactions within the Earth system affect your local environment and how it in turn affects regional and global environments.



## Watershed Dynamics

Where does your water come from? Do you always have enough or is the supply limited where you live? What factors affect the flow of water in the area where you live? The GLOBE Watershed Dynamics Project will enable students to investigate their own watershed in order to understand the flow of water through the watershed, how human activities within the watershed both depend on and impact its hydrology, and how land use changes can affect the plant and animal communities in the watershed.

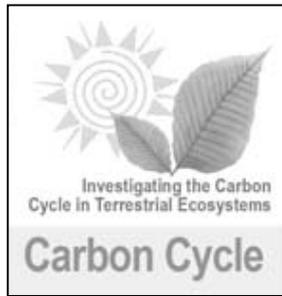


This project will offer GLOBE students the opportunity to conduct science investigations on local and regional watersheds using real-time and historical scientific data from the dataset being constructed by the Consortium of Universities for Advancement of Hydrologic Science (CUAHSI).

## Carbon Cycle

"Carbon: the building block of life." You may have heard this phrase, but have you understood what it really means? Carbon is the most abundant element in living things and accounts for approximately 50% of the total mass of plants and animals. Carbon is also present in Earth's atmosphere, soils, oceans and crust, and cycles between these components on varying time and spatial scales.

The GLOBE Carbon Cycle Project links an international team of scientists and educational outreach specialists with the GLOBE educational community. Through field exercises, computer modeling, and remote sensing, primary and secondary grade level teachers and students will gain knowledge about current carbon cycle research, develop strong analytical skills, and increase their overall environmental awareness.



## FLEXE – From Local to Extreme Environments

FLEXE is a GLOBE project involving study of the deep ocean led by Pennsylvania State University in partnership with Ridge 2000 and InterRIDGE scientists.

Through comparative protocols and online interactions with project scientists and partner schools, students gain an understanding of local and the deep-sea environments, the interconnected Earth system, and the process of science. FLEXE students collect data from their local environment and compare it with data from an extreme deep-sea environment. Scientists guide students in their analysis of deep-sea data through the on-line FLEXE Forum. Scientific reporting, peer review, and communication with scientists at sea during a research cruise cap the students' experience.



## SCHEDULE OF CULTURAL PRESENTATIONS JAMESON HALL

<i>Country</i>	<i>School</i>
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### Monday, 23 June

#### Session 1, 15:15 – 16:30

France	College La Chênaie
Hungary	Bibó István Gimnázium
Estonia	Tallinn Science Secondary School
Netherlands	Sint Maartens College

#### Session 2, 19:00 – 22:00

South Africa	City of Cape Town
Argentina	E.M. 241 “John Fitzgerald Kennedy” & E.P.I. 1345 “Nuestra Señora del Carmen”
USA	Motor City Model UN Club
Croatia	All
France	Lycée Roosevelt
USA	Rosswell Middle School
Thailand	Roong-Aroon
Greenland	GU-Nuuk

### Tuesday, 24 June 2008

#### 19:00 – 22:00

South Africa	LEAP School
Lebanon	American Community School of Beirut
Cameroon	GBPHS Yaounde
Norway	All
USA	Innoko River School
Poland	Gimnazjum 9, sw. Krolowej Jadwigi, Rzeszow
Thailand	Dara Academy
Dominican Republic	Notre Dame School

### Thursday, 26 June 2008

#### 20:00 – 22:00

France	Collège Cantelände
USA	Ramey School
Kazakhstan	Zelyony Bor School
Germany	IGS Franzshes Feld

**GLE LEGACY**

## BUILDING A COMMUNITY OF INFORMED WORLD CITIZENS AND STEWARDS OF THE EARTH

### **Our Legacy**

We are indebted to the many individuals who have helped create the extraordinary experience of the GLE. Our hosts in Africa have opened our eyes to the wealth of cultures, landscape and wildlife that make up this amazing continent. We also have learned about significant African scientific research that is creating a fuller understanding of natural and built environments. We wish to express our gratitude to the people of Africa and to share with them a lasting legacy. A legacy is something left behind that will benefit others and make the world a better place. Our legacy is rooted in GLOBE's commitment to advancing scientific knowledge, environmental stewardship, and improved quality of life in a sustainable world.

We leave behind:

- A greater understanding and appreciation of sustainable communities: what they are and how we can support them
- A shared appreciation for the fragile and unique biomes surrounding Cape Town and a renewed commitment to support their scientific management and preservation
- A commitment to developing tools for learning and collaborative student research about the environment
- Knowledge that the African region has many opportunities for partnership in GLOBE endeavors

As a lasting legacy to our hosts, GLOBE in Africa is organizing a habitat restoration project in the Fynbos. This collaborative project will help eradicate invasive alien plant species as part of a habitat restoration project in a designated area in the South African shrubland.\*

We take with us an admiration and abiding respect for the land and people of Africa. We hope the echo of what we accomplished together resounds throughout the world in action, taking greater responsibility for the stewardship of the Earth and for our future.

\*You are invited to support these efforts with a donation at the GLE.

## **NOTES**



## THE GLOBE PROGRAM'S EFFORTS TO REDUCE OUR CARBON FOOTPRINT

The GLOBE Program Office and the GLE organizers understand that bringing together hundreds of students, teachers, scientists, and the GLOBE community presents an incredible opportunity to learn and share with people from all over the world. This opportunity does come at a cost to the planet in terms of waste produced and energy consumed. Increasingly, concerned citizens, organizations and countries are beginning to speak of the human impact on our Earth in terms of the carbon footprint, or the amount of greenhouse gases produced, measured in carbon equivalents.

Thanks to the efforts of our partners, the GLOBE Program hopes to consciously reduce waste and energy consumption during the GLE. The list below outlines our plan to minimize our impact, based on industry standards. Perhaps you can borrow these ideas and introduce them into your own daily activities. We also welcome new and creative ideas to improve upon these efforts, now and into the future.

### **Disposable Products**

Conferences are notorious for using disposable paper and plastic goods. Though cheap and convenient, these items create an incredible amount of waste. Our conference organizers have made arrangements to reduce the use of paper and plastic whenever possible. Food will be served on durable serving ware and, if not possible, biodegradable serving ware (corn-based, wheat-based, and paper). Reusable cloth napkins and tablecloths for meals will be used instead of paper.

### **Food**

When possible, food will be purchased in bulk to avoid excess packaging. Each delegate will be provided with a refillable water bottle which we encourage everyone to use in order to cut down on single-use bottled water.

### **Accommodations**

Selected venues are centrally located on campus within walking distance of the conference halls. Graca Machel dormitory has solar hot water heaters to preheat the water for use in the dormitory, thereby reducing the use of nonrenewable resources. The Jammie shuttle will also be available as needed to transport people between Graca Machel and the conference halls. Look for **Green tips** in the dormitories highlighting smart ways to cut down on waste.

### **Airline Travel**

Airline travel to South Africa contributes the lion's share of greenhouse gas emissions for the GLE. Over the past few years, it has become increasingly popular to offset or account for the emissions by donating to a company that offsets the emissions through various projects, the most common being development of renewable energy sources. Consider finding a reputable and verifiable organization to offset the carbon consumed during your travel. Although we do not endorse any one organization, [www.carboncatalog.org](http://www.carboncatalog.org) has collected numerous verified offset programs that you may support.



## WHAT NEXT? A GUIDE TO CONTACTING YOUR LOCAL MEDIA

Before you know it you'll be home, back with your family and friends. You'll be asked many questions about your participation in the GLOBE Learning Expedition and you'll tell your stories over and over again. Why not write a short essay about your trip for your school newsletter and your local newspaper back home? This is a great way for you to let your community know what you accomplished this week. Also, you could send the information to local radio and T.V. stations. Maybe they would do a "live" interview with you. It's not every day that someone from your town attends an international science conference in South Africa!

The GLOBE Program office would like to hear from you if you are successful in telling your stories to your local media. Mail newspaper articles to:

GLOBE Communications, UCAR, P.O. Box 3000, Boulder, CO 80307.

Send electronic scans or links to electronic news items to <communications@globe.gov>

Example:

### Press Release

Date:

To: Your local newspaper, radio or television station

From: Your name, address, phone number/email

For Immediate Release

**Students from \_\_\_\_\_ School Attend GLOBE Student Learning Expedition in Cape Town, South Africa 22 – 27 June 2008**

Students from \_\_\_\_\_ School recently attended the GLOBE Learning Expedition (GLE) in Cape Town, South Africa. Hundreds of students from more than 20 countries gathered on the University of Cape Town campus to share their research about the dynamics of the Earth's environment. The GLE was organized by the GLOBE Program, the world's largest international science-education program. Students shared their research and poster projects and took part in field studies and cultural activities.

GLOBE countries around the world conducted student competitions to select their delegations. Each GLOBE Country Coordinator was responsible for the selection of the student presentations.

*(insert information about your student delegation here)*

Each delegation designed a plan to promote GLOBE student research to help understand and improve their local communities.

*(provide details or your plan)*

**Conclude with personal information: what you learned, enjoyed most, hope to do next to expand upon what you accomplished in South Africa.**



GLE Teachers, Students, Alumni, and Scientists:  
GLOBE is proud to announce the initial development phase of

## THE GLOBE STUDENT RESEARCH CAMPAIGN ON CLIMATE CHANGE 2010-2012



Our goal over a 2-3 year period, beginning in 2010, is to involve more than 1,000,000 students in a **Worldwide Student Research Campaign on Climate Change**. This international event will enhance climate literacy and understanding for millions of people worldwide, through student research investigations on a set of interrelated climate topics. GLOBE, as the world's largest international science education program, endeavors to take environmental education to the next level... by leveraging our scientific protocols, educational activities, experience, and worldwide network of GLOBE Partners, teachers, scientists, alumni, schools and countries.

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GLOBE's new Earth System Science Projects (ESSPs), will be a key component of this effort, supporting student research on Climate and Energy (Carbon Cycle), Climate and Water (Watershed Dynamics), Climate and Ecosystems (Seasons and Biomes), and Climate and Oceans (From Local to Extreme Environments).

The Climate Change Campaign will provide a variety of opportunities for meaningful, relevant and important student research that leads to understanding and action at local to global scales. GLOBE (**Global Learning and Observations to Benefit the Environment**), has always been considered a unique educational force to educate, train, inspire and encourage young people to preserve the environment for current and future generations. Through GLOBE's new Climate Change Initiative, GLOBE will empower students, teachers and communities around the world to realize their individual and collective potential by addressing the single most challenging issue of our time.

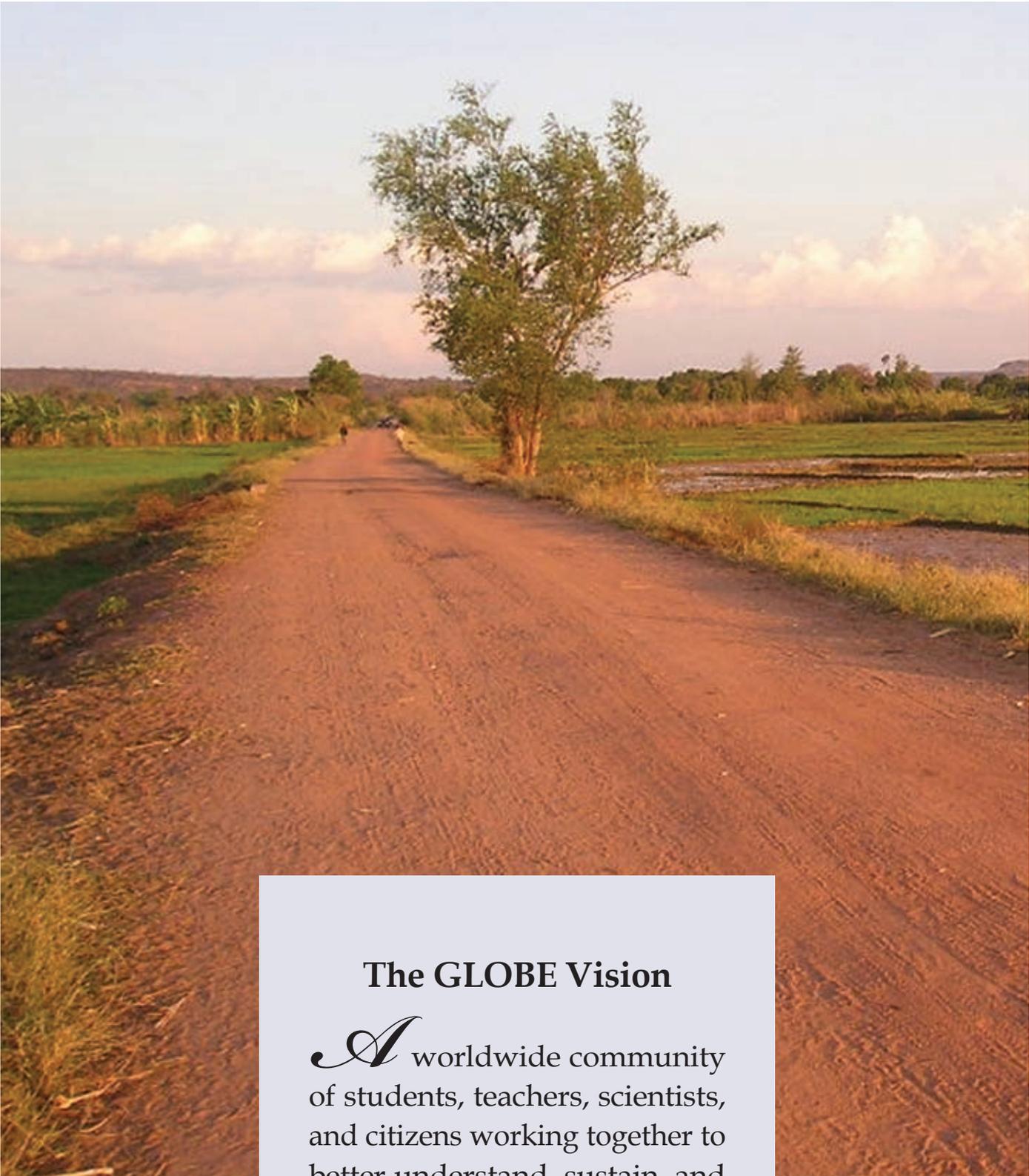


We are interested in your ideas! Please send specific investigation topics and questions around Climate-Water, Climate-Energy, Climate-Ecosystems, Climate-Human Health, and any other topics and questions of interest for the GLOBE Climate Campaign you may have to [ClimateChangeCampaign@globe.gov](mailto:ClimateChangeCampaign@globe.gov).

**WWW.GLOBE.GOV**



## **AUTOGRAPHS**



## The GLOBE Vision

*A* worldwide community of students, teachers, scientists, and citizens working together to better understand, sustain, and improve Earth's environment at local, regional, and global scales.



22 - 27 June 2008

# GLOBE LEARNING EXPEDITION

GLOBE Student Research for Sustainable Communities

*Cape Town, South Africa*



*Go well/Hamba Kakuhle/Mooi loop*



NASA



NSF



U.S. Department  
of State



UCAR

Colorado  
State  
University

CSU