

Xpedition

STUDENT INVESTIGATIONS



Student Research Investigation to the “Roof of Africa” Mt. Kilimanjaro, Tanzania



A Seasons & Biomes
GLOBE Africa Project

Xpedition Information Packet





Scientist Driven

Congratulations! Your journey begins here. This packet contains all the information you will need for your virtual trip to Tanzania as part of the Xpedition.

Your packet includes:

- Page 1: Swahili 101
- Page 2: The Xpedition
- Page 3: GLOBE Protocols
- Page 4: Xpedition Team Members
- Page 5: Polar TREC Webinar Information
- Page 6: Safari Itinerary
- Page 8: Lemosho Route Itinerary
- Page 11: Xpedition FAQ

Swahili 101: Important Swahili words for all Safari Travelers

It is always fun when a visitor learns a bit of the Swahili language. Below are some Swahili words that could help you get started.

Hello	Jambo	Coffee	Kahawa
How are you?	Habari	Milk	Maziwa
Thank You	Asante	Beer	Bia or pombe
Thanks You very much	Asante sana	Lion	Simba
OK / fine	Sawa sawa	Buffalo	Nyati
Yes	Ndiyo	Elephant	Tembo
No	Hapana	Rhino	Kifaro
Good	Mzuri	Leopard	Chui
Bad	Mbaya	Giraffe	Twiga
Please	Tafadhali	Hippo	Kiboko
Water	Maji	Antelope	Swala
Ice	Barafu	Bird	Ndege
Hot	Moto	Cheetah	Ndoa Ndoa, Duma
Cold	Baridi	Bug	Dudu



Alumni Guided

A Seasons & Biomes Project

GLOBE (Global Learning and Observations to Benefit the Environment) is a worldwide hands-on, primary and secondary school-based science and education program. GLOBE's vision promotes and supports students, teachers and scientists to collaborate on inquiry-based investigations of the environment and the Earth system working in close partnership with NSF Earth System Science Projects (ESSPs) in study and research about the dynamics of Earth's environment.

Our Xpedition Team of Students, Educators and Scientists will travel to Tanzania, Africa to Climb the largest freestanding mountain in the world to gather environmental data within the distinct biomes of Mt. Kilimanjaro. Along the way we hope to use GLOBE protocols to better identify the six unique biomes on the mountain.

This GLOBE Seasons and Biomes Project endeavor will contribute scientific measurements to compare with previous research and serve as a comparative baseline for future study areas to examine the effects of climate change that threaten the entire ecosystem of this World Natural Heritage Site.

The Xpedition



Mt. Kilimanjaro - from the town of Moshi



Student Focused

GLOBE Protocols



Highlighted Protocols

The following GLOBE Protocols will be used by Xpedition Students and Teachers on the mountain. Click on the Protocol names below for more information. Collected data will be entered into the GLOBE Database and displayed at <http://xpeditiononline.com/data.html>

Air Temperature Protocol – Students use a digital thermometer to measure the current temperature.

Cloud Protocol – Students estimate the percent of cloud and contrail cover, observe and record types of clouds, the number of each type of contrail.

Surface Temperature Protocol – Students use a infrared thermometer to measure the ground surface temperature.

Soil Temperature Protocol – Students will measure soil temperature at 5 and 10 cm depth using a soil thermometer.

pH Protocol – Students will measure the pH of water using either pH paper or a pH meter.

Electrical Conductivity Protocol – Students will measure electrical conductivity of water at freshwater hydrology sites.

Relative Humidity Protocol – Students measure the relative humidity using either a digital hygrometer or a sling psychrometer.



Xpedition Team Members

2012 Xpedition Team Members

Science Team

Kenji Yoshikawa	Lead Scientist	International Arctic Research Center
Kenji Narita	Scientist	Akita University – Japan
Bob Bolton	Scientist	University of Alaska
Julia Kalilova	Scientist	Russian Academy of Science
Shinichiro Aiba	Scientist	Kagoshima University – Japan

Students

Isaac	Student	Valdez High School – Valdez, Alaska
Logan	Student	Gilson Middle School – Valdez, Alaska
Leeann	Student	Irma Rangel Leadership School – Dallas, Texas
Maddy	Student	Boulder High School – Boulder, Colorado
Yllias	Student	Benin Academy of Science – Porto-Novo, Benin
Frankie	Student	GLOBE Tanzania
Robert	Student	GLOBE Tanzania

Educators

Dana Clark	Teacher	Irma Rangel Leadership School – Dallas, Texas
Dan Heckathorn	Teacher	Alaskan Pipeline – Valdez, Alaska
Jenny Heckathorn	Teacher	Valdez High School – Valdez, Alaska
John Wood	Teacher	Talbert Middle School – Huntington Beach, CA
Tom Devine	Teacher	University of Phoenix – Conifer, Colorado
Michael O’Toole	Xpedition Lead	University of Colorado – Boulder, Colorado

Film Crew

Art Howard	Camera Man	Geoff Haines-Stiles Productions
Andy Quinn	Camera Man	Geoff Haines-Stiles Productions



2012 Polar TREC Webinar Announcement

There will be 2 LIVE Webinars this year! Each Webinar is a one hour presentations via satellite phone with members of the Seasons and Biomes, GLOBE Africa Xpedition on Mt Kilimanjaro. The presentations are part of the GLOBE program, to educate the world on the student research and science taking place on the mountain.

Webinar Information

Date: Wednesday 26 September, 2012

Time: 1:00 PM EDT – 12:00 PM CDT – 11:00 MDT – 10:00 PDT – 9:00am ADKT

Location: Lava Tower Camp 15,196 Feet

Theme: Scientist Led Webinar – What is Globe, What is it like thus far in the field? Highlighting the permafrost research taking place on the mountain. Other science topics include hydrology, and mountain ecology

Date: Monday 1 October, 2012

Time: 1:00 PM EDT – 12:00 PM CDT – 11:00 MDT – 10:00 PDT – 9:00am ADKT

Location: Xpedition Basecamp

Theme: Student & Teacher Led Webinar – What is Globe, What was it like in the field? Highlighting student research and the use of GLOBE protocols. Reflection and experiences from the mountain including pictures and video from the trek.

2012 Xpedition Webinar Page

<http://xpeditiononline.com/2011journal/2011webinar.html>



3 Day African Safari

3 Day African Safari

Serengeti / Olduvai Gorge / Ngorongoro / Masaai Burma

20 September – OLDUVAI GORGE / SERENGETI NATIONAL PARK

Dreams become reality this morning as you depart Arusha in your custom made safari vehicle for your first experience at wildlife viewing, Big Expeditions Style. Your destination today is Serengeti National Park. Drive across the grasslands of the Serengeti; be prepared for bumps and bounces along the unpaved roads. A short stop at Olduvai Gorge, where famed archaeologists Louis and Mary Leakey discovered the fossilized remains of the earliest known man, believed to be about 1.8 million years old. You will have plenty of opportunities for wildlife viewing en route to your safari camp – from which you'll experience the full majesty of the African wilderness.

Take a deep breath and enter the exotic paradise of the Serengeti Plains, where your adventure promises thrilling game viewing, an incredible exploration of the unspoiled African plains. Dinner & Overnight at Mobile Camp

SERENGETI NATIONAL PARK

Arguably the most famous National Park in the World, the Serengeti perhaps defines the safari experience as surely as the wildlife that inhabits it. Established in 1951, and covering an area of almost 15,000 sq km –an area comparable to the state of Connecticut or Northern Ireland, the Serengeti hosts a fantastically diverse eco-system. The famous short and long grass plains of the south slowly unfurl into the Acacia savannah of the central area, the hilly, more densely wooded areas of the north, and the extensive woodland in the western corridor, each with its own resident variations of African wildlife. The Serengeti promises all that the first-time game-viewer or experienced safari-hand could ever hope to witness and it rarely, if ever, disappoints.



3 Day African Safari

21 September – SERENGETI NATIONAL PARK

Rise early for a morning game drive as a new day dawns in the Serengeti, witnessing first-hand vivid vignettes representative of Africa's circle of life. Your safari guide will share fascinating insights into the poignant everyday rituals of the wildlife residing within the African bush. Another game-watching this afternoon after lunch at your camp. In the evening return to your camp. Dinner & Overnight at a Public mobile camp

22 September – NGORONGORO / MASAII BURMA / ARUSHA

After an early breakfast descend into the crater to experience the true spirit of Africa, the Africa of bygone days, when you explore wildlife-rich Ngorongoro Crater, long regarded as the "Garden of Eden." Within the walls of the crater lie short grasslands, swamps, forests and a freshwater lake, inspiring continual migration of animals in and out of the crater. From the comfort of your four-wheel drive vehicle, crafted exclusively for Ecological Wilderness Adventures, you'll have an opportunity to spot the Big Five – buffalo, elephant, leopard, the black maned lion and the endangered, rare black rhinoceros – as well as hyenas, baboons, and flamingos. Enjoy a delightful picnic lunch in the heart of this ancient volcanic crater; it is sure to be a memorable highlight of your safari. On the way back to Arusha you will stop visit a local Masai village.

NGORONGORO CRATER

The Ngorongoro Conservation Area (NCA) is not a national park, but an integrated region that strives to meet the social and developmental needs of the resident Masai people. The conservation area is also involved in soil, water catchments and wildlife conservation, as well as the sensitive development of ecotourism. Local Masai people have grazing rights on the NCA plains, and you may well be surprised by the sight of them tending their herds alongside zebra and other wild animals.

The Ngorongoro Conservation Areas centerpiece, the Ngorongoro Crater, often referred to as the eighth wonder of the world is the largest unbroken caldera in the world, and the first sight of it is truly breathtaking. The floor of the crater is home to a year round population of varied wildlife, including the almost extinct black rhino. Animal densities are high, and game viewing is excellent, with visitors after being able to get up close to the now almost habituated "wild" animals.



Kilimanjaro Lemosho Route

9 Day Lemosho Route including night in Kibo caldera!

Why this itinerary?

The Kilimanjaro Lemosho Route offers the complete Kilimanjaro experience, more acclimatization time, more spectacular scenery, and even a night in Kibo caldera. Note: this itinerary ascends via Stella Point and NOT the Western Breach and is for that reason considered to be a safer route.

Description

Starting on the Western side of Kilimanjaro this ascent covers all of the most spectacular areas of Kilimanjaro. The trip is fully supported with spacious guest tents as well as a mess tent with lightweight tables and chairs and all cutlery. Our trips also include a toilet tent in camp and most importantly knowledgeable professional guides that go through bi annual training. Our logistics team at our base monitors your trip from start to finish.

BASECAMP

Upon arrival at Kilimanjaro International airport, you will be met by our driver and assisted through customs and immigration formalities. Thereafter, drive to Arusha the nerve center of East Africa, and getaway to several national parks in the north of the country. Overnight at a hotel

23 September - DAY 1 - FOREST CAMP

From our hotel we set out in vehicles to the starting point of our Kilimanjaro climb, the Lemosho trail. Here you meet the rest of your crew and set off at a leisurely pace into the Rain forest. Lunch is taken on trail and camp is reached by mid afternoon. Overnight Forest Camp (9200 ft/ 2804m)



Kilimanjaro Lemosho Route

24 September - DAY 2 - SHIRA 1 CAMP

From the forested slopes of Lemosho you ascend through Podocarpus and Juniper forest and break out of the forest on to the heath zone and the Shira Plateau. Lunch is taken on trail and you arrive in camp mid afternoon.

Overnight Shira 1 Camp (breakfast- lunch – dinner(11450ft/ 3500 mt)

25 September - DAY 3 – MOIR HUT

Today we move even higher to Moir camp,13500ft (4114m).This spectacular camp is located beneath the Northern ice field of Kilimanjaro.Overnight Moir camp.

26 September - DAY 4 - LAVA TOWER CAMP

The route to Lava Tower takes you out of the heath zone in to the alpine desert zone. Here relatively little flora or fauna can survive the extreme temperature ranges and conditions that typify this zone. Lunch is taken in camp. In the afternoon, dependant on weather conditions, there is an option to scramble to the top of the nearby Lava Tower. Overnight Lava Tower Camp 15090ft/4600mt. LIVE Webinar!

27 September - DAY 5 – KARANGA CAMP

Today we go downhill to the Baranco Valley, climb the Baranco Wall and travel to Karanga camp, 13900feet (4235mt) 5-6hrs

28 September - DAY 6 - KOSOVO CAMP

Today is another half day ascending to Kosovo camp. Once again lunch is taken in at Barafu camp camp allowing plenty of time to relax before the summit bid. Desolate alpine desert and at times strong winds rip over this camp and yet in the evening splendid views of Mawenzi volcano are the norm.16,500ft 4-5hrs Overnight Kosovo Camp



Kilimanjaro Lemosho Route

29 September - DAY 7 - CRATER CAMP

Unlike other routes with a night time ascent, your hike selection affords you a day time ascent to Kibo crater. The going is slow but with constant encouragement from your climb team the rim of Kibo is reached before descending a little way into the caldera to Crater camp. The afternoon is spent relaxing and short walks can be taken with one of your guides. 18700ft/5700mt 5-6hrs Overnight Crater Camp

30 September - DAY 8 - MWEKA CAMP

After a night in the crater you now have the shortest final summit bid of any route. With such a short distance to the summit from the crater (around 1 hour) means that timing arrival with the sunrise is much easier and quite spectacular. The summit of Kilimanjaro is the top of the highest freestanding mountain in the world 19339ft/5894mts. After your summit bid you then descend for a final night on the mountain at Mweka Camp 10,000ft passing back through the heath zone. Endemic Proteas, pollinated by Malachite Sunbirds are plentiful. 6-7hrs Overnight Mweka Camp

1 October - DAY 9 - PARK GATE - ARUSHA

After breakfast you descend once again through Rain forest and around mid day after saying farewell to your crew, you are picked up and transfer back to your hotel for a well deserved shower and Webinar!



Frequently Asked Questions

1. What is the Xpedition Project?

The Xpedition is a GLOBE Africa sponsored, GLOBE Seasons and Biomes endeavor, to contribute scientific measurements to compare with previous research on the effects of climate change on Mt. Kilimanjaro. The Xpedition Team, made up of GLOBE Students, Educators and Scientists will travel to Tanzania, Africa to climb the largest freestanding mountain in the world to gather environmental data within the distinct biomes of Mt. Kilimanjaro. The Xpedition Team will share those results and their eyewitness account of the journey with followers around the world online at www.xpeditiononline.com.

2. When is the Xpedition?

The Xpedition starts on **23 September, 2012** and will conclude on **1 October, 2012**. Questions will be accepted prior to the start of the Xpedition and posts from Team Members will continue for several days after 1 October, concluding with the Xpedition 2012 Revisited, approximately one week after the climb. A detailed Itinerary of the Xpedition can be found at <http://xpeditiononline.com/itinerary2012.html>

3. Who is sponsoring the Xpedition?

The Xpedition is a GLOBE Africa and Seasons & Biomes ESSP project. All equipment and web content was provided by either GLOBE Africa or the Seasons & Biomes ESSP Project.

4. Will a scientist be involved with the Xpedition?

Dr. Kenji Yoshikawa of the University of Alaska Fairbanks, one of the world's leading authorities on permafrost research is the Lead Scientist. He will be joined on the mountain by Dr. Kenji Narita a botanist from the University of Akira, Japan, Dr. Bob Bolton a hydrologist from the University of Alaska, Julia Kalilova, Russian Academy of Science, and Dr. Aiba, Kagoshima University, Japan. They will all be collecting data and working directly with the GLOBE students on the mountain as well as answering questions from students following online.

5. **How can my school sign up for the Xpedition?**

Schools can sign up to receive email updates from the mountain at info@xpeditiononline.com All Additional information can be found on the Xpedition web site at www.xpeditiononline.com

6. **How can my students participate in the Xpedition?**

Classrooms around the world are encouraged to participate by contributing biome descriptions of their region and posting them on the Xpedition web site and interacting with the Xpedition Team of GLOBE Students and Scientist on the mountain. Students are also encouraged to collect data of their local environment using GLOBE Protocols. That data can be added to your biome description but should also be entered in the GLOBE database. Questions & Biome descriptions should be sent to questions@xpeditiononline.com

7. **How will students benefit from participating in the Xpedition?**

Students will learn more about their local environment and its relationship to other biomes, by collaborating with Earth systems scientists and other schools as they conduct their own investigations. Students will be introduced to the study of climate in an interactive environment that promises to fundamentally more engaging than classroom study alone.

8. **How will student collected data be used by researchers?**

Student collected data on the mountain will be used to validate permafrost studies by Dr. Kenji Yoshikawa of the University of Alaska Fairbanks. GLOBE data collected by schools following the Xpedition will be added to the GLOBE database to assist with student centered regional climate research.

9. **Will my biome be posted on the Xpedition web site?**

All biomes that are sent to info@xpeditiononline.com will be posted on the Xpedition web site. To assure that your biome is posted during the climb, starting September 23rd, it is recommended that you send in your biome as soon as possible.

10. **What is a biome?**

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. Please email biomes to info@xpeditiononline.com

11. Which GLOBE Protocols will be used on the mountain?

The following GLOBE Protocols will be used each day on the mountain by GLOBE students and the data collected will be displayed on the Google Earth feature of the Xpedition Web Site. Students following the Xpedition online are encouraged to use the same GLOBE Protocols to collect local data to contribute to the GLOBE Database.

- Air Temperature Protocol
- Cloud Protocol
- Surface Temperature Protocol
- pH Protocol
- Electrical Conductivity Protocol
- Soil Temperature Protocol
- Relative Humidity Protocol

The Air Temperature, Surface Temperature & Relative Humidity Protocol's are modified due to the absence of a certified GLOBE Weather Station at each collection point on the mountain.

12. Will my question be answered from the mountain?

The Xpedition Team will answer as many questions as possible from the mountain.

Questions that are not answered during the climb will be addressed in Kilimanjaro 2012 Revisited, to be posted approximately one week after the completion of the climb. Email all questions to questions@xpeditiononline.com

13. How do I join the 2013 Xpedition as a Team Member on the mountain?

Anyone interested in joining the 2013 Xpedition Team on Mt. Kilimanjaro should email info@xpeditiononline.com Climbing Mt. Kilimanjaro requires a great deal of preparation and spots for the 2013 Xpedition Team are filling up quickly, don't hesitate.

14. Why Mt. Kilimanjaro?

Mt. Kilimanjaro, located near the equator in Tanzania, Africa, is a World Natural Heritage Site. One of the World's 7 Summits, the highest mountains on each of the 7 continents, Kilimanjaro is the highest peak in Africa at 5,895 meters Although it is not the tallest mountain on Earth, Kilimanjaro is the tallest free-standing mountain in the world, rising 4,602 meters from its base. The glaciers of Kilimanjaro are quickly disintegrating under the equatorial African sun. Snowfall during the rainy season isn't keeping pace with the melting that occurs during the dry season, and this lack of replenishment is taking its toll.

15. **How is this year's Xpedition different than last year's trek?**

Students taking part in the collection of data on the mountain will be continuing the research began by the 2009 Xpedition Team. Students will compare their findings to historical data and new data loggers will be positioned on the mountain to be collected by future GLOBE students. New web features including a Google Earth guided tour and GLOBE Protocol Videos will also be included on the daily journal pages.

16. **Webinar Information**

There will be 2 LIVE Webinars this year! Each Webinar is a one hour presentations via satellite phone with members of the Seasons and Biomes, GLOBE Africa Xpedition on Mt Kilimanjaro. The presentations are part of the GLOBE program, to educate the world on the student research and science taking place on the mountain.

Webinar Information

Date: Wednesday 26 September, 2012

Time: 1:00 PM EDT – 12:00 PM CDT – 11:00 MDT – 10:00 PDT – 9:00am ADKT

Location: Lava Tower Camp 15,196 Feet

Theme: Scientist Led Webinar – What is GLOBE, What is it like thus far in the field?

Highlighting the science taking place on the mountain, permafrost research, hydrology, and mountain ecology

Date: Monday 1 October, 2012

Time: 1:00 PM EDT – 12:00 PM CDT – 11:00 MDT – 10:00 PDT – 9:00am ADKT

Location: Xpedition Basecamp

Theme: Student & Teacher Led Webinar – What is GLOBE, What was it like in the field? Highlighting student research and the use of GLOBE protocols. Reflection and experiences from the mountain including pictures and video from the trek.

2012 Xpedition Webinar Page <http://xpeditiononline.com/webinar.html>