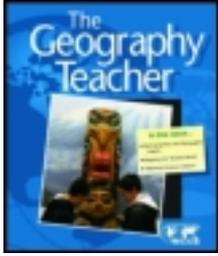


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Census in Schools Program

census.gov

What is the Census in Schools Program?

In an effort to achieve the goal of an accurate and complete count of the U.S. population, the Census Bureau's Census In Schools (CIS) program provides a wide array of print and online standards-based materials for K-12 teachers, students, and parents. Online classroom materials have an accompanying matrix that links lessons to standards in geography, civics, reading, math, and history. These lessons serve to achieve a short-term goal of providing information to students, who then will be able to inform parents and other community members about the importance of participating in the census. Also, the CIS program will develop a long-term goal of developing students' understanding as future, informed participants in our democracy.

Why Should Geographic Educators Be Involved?

K-2, 3-4, 5-8 and 9-12 lessons for the United States, American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico and the U.S. Virgin Islands are available online. Materials enhance the study of classroom geography and relate directly to concepts and skills incorporated in *Geography for Life*, the national geography content standards. The lessons provide opportunities to observe, synthesize and present information, and to apply data to the study of spatial relationships among the components of human and physical systems.

The lessons that explain the process of census taking and the absolute confidentiality of census information include cross-curricular references, reproducible student worksheets, printable assessment activities, and skill pages. Teaching tools include a page of census facts and teaching tips. Activities are grade-level appropriate; assignments include such activities as mapping and graphing of demographic data, student assessments of changes in geographic distribution of population over the decades, and population forecasting. Lessons are downloadable at www.census.gov/schools.

Federal, state, local, and tribal governments use census information for planning and allocating funds based on the accurate demographics of a community. Communities depend on census information to make decisions about new school construction, libraries, and other public buildings. Community organizations use census data to develop child care centers, community action projects, and other social service programs. Census numbers help businesses identify where to locate activities that can lead to jobs. Census totals are used to determine the number of seats each state will have in the U.S. House of Representatives.

Students who learn about the importance of census participation will be able to inform parents and other adult community members about this opportunity to impact their own community. In some cases, students can serve as reminders to adults to complete their 2010 Census form.

By answering the census form, respondents directly affect their community's educational services and social service programs along with other programs like job training, health care, and transit improvements for years to come.

When Should I Use CIS Materials?

- **Now!** Already, schools have launched outreach programs to ignite community participation in the 2010 Census. Many schools have joined in motivating community members and are actively involved in teaching lessons and conducting projects related to urging participation in the census. If your school is not now involved, you will want to take immediate steps to activate your participation. Remember, lessons relate to standards and are interdisciplinary, and they will provide a practical application of learning for your students.
- **During Census in Schools Week!** Each school will choose a special calendar week during January, February, or March at a time that best enables the school to focus on learning about the census and sharing the information with the community. Using materials provided online and in the mail from Census In Schools, you can plan a variety of classroom activities that focus on a complete and accurate count in your community. Student-developed projects incorporating geography and census data can verify the importance of census cooperation to the community. Be certain to distribute Census Bureau-provided materials, available online in more than 20 different languages at www.census.gov/schools.

How Can I Learn More?

- **Visit our sessions and booths at educational conferences.** Census In Schools has and will continue to conduct sessions at major 2009-2010 educational conferences. Our exhibit booth personnel disseminate materials and address questions.
- **Read about the CIS program in educational print journals and online newsletters.** The print journals of several major educational associations contain articles about both the CIS program and other census topics. Additionally, the online newsletters of many of our educational partners have and will contain articles with focused information.
- **Sign up for our CIS online educator newsletter.** The regular monthly newsletter published by Census In Schools during the school year contains timely information about CIS activities and creative suggestions for integrating Census Bureau-produced data into the classroom setting. Ideas include downloadable worksheets focusing on data related to holidays and featured celebrations. Go to www.census.gov and click on "For Teachers." 



Ask Dr. de Blij

Dr. Harm de Blij

Q I just read in my local newspaper that the people of Greenland are going to vote on independence. Can they be serious? My small home town has more people than “Kalaallit Nunaat.” Maybe we should start thinking about this too – we’ve all had it up to here with Washington.

Chris McCulley • Jackson, Tennessee

A Yes, they’re serious – the eligible voters (out of 55,000 residents) just had a referendum on whether to have this election, and the initiative was approved. I spent some time last September in the capital, Nuuk, where it was the talk of the town, and there are three sides to the issue. Indigenous people, many of whom feel wronged by the European acquisition of their territory (and waters), strongly favor independence. People of Danish ancestry and other Europeans who have become “Greenlanders” tend to be opposed and point to the tangible results of outside assistance and investment. A third, smaller contingent of Asians and other immigrants seems to be divided on the matter. By the time you read this the vote may have already happened and independence may be in the making.

Before you start organizing an independence movement for Jackson, consider this: Greenland isn’t all ice-covered bedrock. By United Nations Law of the Sea rules, an independent Greenland could draw its own maritime boundaries and beneath those frigid waters may lie oil reserves that could transform the economy. “We’ll be the Abu Dhabi of the Arctic”, said a fellow I ran into at a supermarket in Nuuk. But will the locals do any better under globalization than under colonization?

Q I’m a retired geography teacher, and I clearly remember the time when researchers were predicting global famine and widespread starvation. Then came the “Green Revolution” and those fears faded. But now I read about hundreds of billions of people lacking adequate food – today! Is the specter of hunger looming again?

Denise Celliers • Lafayette, Louisiana

A The plight of the *Bottom Billion*, as Paul Collier calls the planet’s poor in his urgent book, prominently involves malnutrition, a widespread malady that afflicts hundreds of millions in the global periphery. Adequate food is not just a matter of calories – it also requires a reasonably balanced diet. Miss out on this when you’re a youngster and it can affect you for life. When the success of the Green Revolution increased yields of rice and wheat, the specter of starvation did indeed recede, but it did not defeat malnutrition.

Today the global food situation is again giving rise to anxiety. While the Green Revolution’s continuing research has expanded the range of enhanced crops to include some African staples, and once-hungry countries (including even India and China) can export some grains, economic globalization is raising the cost of food on local markets, a trend that may presage serious trouble. And searing, widespread droughts in breadbaskets from Australia to Argentina to northern China remind us that, in an era of climate change and dwindling water supplies, the gap between need and availability can quickly grow again. Put this in the context of continued population growth – the planet will add 3 billion inhabitants before 2100 – and your concern is well justified.

Q I recently read your book *Geography: Realms, Regions and Concepts* and became puzzled and angry when I saw you group Taiwan as part of a “Jakota Triangle.” I object to this because Taiwan’s official name is Republic of China, the people speak Mandarin, use Chinese characters, and have strong cultural and historical ties with China. Taiwan is very far from Japan and Korea, and the Jakota Triangle is awkward in your map drawing. I wonder if you have a hidden agenda of supporting Taiwan independence... (this) is insulting to Chinese people, because the West and Japan have tried to split China for over 150 years, ever since the Opium War. Witness Korea, Mongolia, Xinjiang, Tibet. Is this another form of separatist movement or cartographic aggression? Please don’t group Taiwan with Japan and Korea like a Western Pacific defense shield in the mind of a Pentagon general.

Taoshun Chu • via email

A Please be assured that the map you refer to (consisting of an East Asian region comprising Japan, South Korea, and Taiwan) is not part of any hidden agenda or separatist movement but reflects certain geographic realities in the realm. Colonial histories, economic successes and democratic achievements set these three East Asian “tigers” apart from other regions. But, as I note throughout the book, regions change over time, and undoubtedly the Jakota Triangle, like the mainland’s Pacific Rim, will be overtaken by developments that will change the regional framework. Meanwhile, my hope has always been that growing rapprochement between Taipei and Beijing will cause China to learn some important lessons from Taiwan. The freedoms of political choice, expression, organization, and other liberties that prevail in Taiwan will someday make China a far more self-confident and successful society than it is today. Fortunately, observant scholars like you will undoubtedly be part of a process that will not only reunite China but guide it to a world position that will render regionalizations such as the Jakota Triangle obsolete. 🌐

Eritrea: Forever a Part of Me

Lucy Negash

James Madison High School
Vienna, Virginia



Main street of Asmara, the capital city of Eritrea
All photos property of the author

The name Eritrea comes from the Greek word *Erythraia*, which means “Red Land.” This country has a varied past, with a rich cultural history and a strategic location that has brought this tiny, newly-freed country into the 21st century. While it may have been colonized for much of its history, this young nation has much to offer on its own.

This small state was once a part of the ancient kingdom of Axum, the first Christian civilization in Africa. It declined in the 8th century C.E., and was revived when it was taken over by the Ottoman Turks in the 16th century, and later the Egyptians. The colonization and occupation of the Turks was the longest of all, which lasted from 1557 to 1866. The Italians captured its coasts in 1885 and declared partial sovereignty over the land according to the Treaty of Ucciali. They named the land after the Roman name for the Red Sea – *mare erythraeum*. It remained a part of Italy until WWII, when it was captured by the British in 1941. It was later administered as a UN Trust Territory, and in 1962 it was incorporated with Ethiopia without the consent of the Eritrean people. For the next 32 years the land was broken in a brutal war of independence, eventually ending in the split from Ethiopia and the birth of Eritrea as an independent nation in 1991.

Today, Asmara is the bustling capital of Eritrea, located at 15°N and 39°E. The summer months, from April to August, vary in temperature due to the difference of elevations of Eritrea’s major cities. Asmara, with an elevation of 2,360 meters, is generally cooler than the coast, with an average yearly temperature of 16°C (60°F). The coastal regions are much hotter, with an average yearly temperature of 30°C (86°F). The climates of its many regions also change: high temperatures and desert land run along the Red Sea coastline, with cooler and wetter lowlands to the west, and semi-arid western hills and lowlands beyond that. The rainiest season falls between June and September, except in the coastal desert. With its high, precarious mountain peaks in the



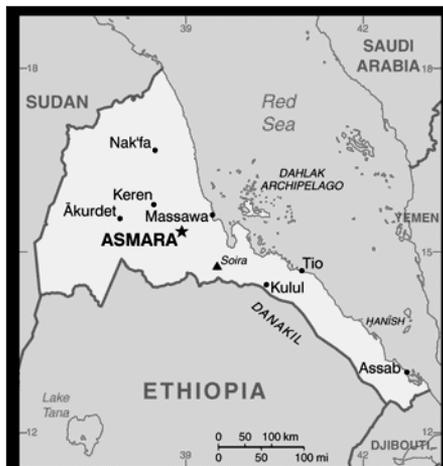
north, driving between the capital and the coast is an unforgettable adventure of a lifetime.

Religion has always played a huge role in Eritrea’s ethnic culture, government, and history over time. The major religions are Islam and Christianity, with roots of both dating back to ancient times, when many Islamic and Christian states came through Eritrea and the Red Sea for trade. Many religious customs are still upheld in a country with a diverse religious population, such as the muezzins that can be heard calling Muslims to prayer at dawn. Some clothing also abides by religious standards: some Muslim

women wear facial veils, as they do all over the world, and Christian women wear thin white garments, with light head coverings. Very basic versions of this dress are worn everyday, but they are adorned with gold jewelry, embroidered beads, and intricately decorated scarves that are worn on special occasions. Food highlights very hot spices and incorporates meat, bread, and vegetables as staples of a typical Eritrean diet. Interestingly, Italian food such as pasta, spaghetti, and lasagna is commonly eaten, as one of many permanent influences of the Italian colonization. Language also affects communication between ethnic groups that exist in Eritrea. The majority of people speak Tigrinya, the ethnic language of the area. These Semitic languages base most of their roots from many other local tongues, such as Hebrew and Arabic. A smaller minority, especially of the elders, also speak Italian.

Though the country may seem open to interacting in the world’s daily communication and participating in the global economy, it has been shut off from dealings with the outside world due to the war with Ethiopia and the autocratic policy of the government, led by President Isaias Afwerki. Leading the country since 1993, Afwerki has rejected foreign aid for the people, eliminated opposition political opponents, restricted religious groups, and eradicated free press.

With its authoritarian government, it may seem a difficult task to attempt to visit a country that has been such a well-kept secret. But I have been there *twice*; to a land that offers so much more than just daily scorching temperatures. My first visit was in the Fall of 2005, when I went to my uncle's wedding. Being a gangly sixth-grader, this trip opened my eyes dramatically to the hardships and experiences of those who live without the amenities we take for granted, such as showers and air-conditioning. Fortunately, my grandmother was lucky enough to have many modern appliances, but there were many who lived on her same unpaved, bumpy dirt street who did not. We saw many children there without shoes, and animals such as chickens and goats which ran about freely in the neighborhoods. It was easy to tell where the "suburbs" ended and where the main streets began. There were many restaurants, shops, and cafés, which all took great pride in creating everything they sold – helped, perhaps, by the importing and exporting of goods under the current government being very limited. I do remember a certain restaurant named Castillo's, seated high up on a hill, which served a delicious steak and pasta that I came back for on my second trip. Both times my family drove down to Massawa, the "busiest" port city in all of Eritrea. While not much continuous shipments or imports affected the city, it had an old charm all its own. Especially in this town could one see the remnants of past cultures who had settled there, particularly Ottoman Turks. I remember driving into the main town and being amazed at the sight of a large mosque, with half of its dome missing due to a bomb attack there. I learned later that it had dated back to the times of the Ottomans, and learning about the Ottomans this year in my World History class only helped to reiterate what I had already seen. Massawa – even more than the Northern, higher elevated Asmara – was one of the hottest places I had ever visited. Air conditioning was my new best friend and very light clothes were acceptable here. I remember one of our hotel hosts saying that the average temperature here daily was near 105°F. Even swimming in the Red Sea was a new experience; the sand felt like a smoldering crust over the land, and many sprinted across the beach to reach the water. The sea itself was extremely salty, and also like hot bath water, and I made the mistake myself many times of going beneath the water to reach the cooler depths, only to come up with my eyes watering from the brackish water. But there were also very different beachside attractions there than in the United States – a Bedouin man rode his camel along the tide, asking for a fee to ride his animal. I accepted, and was then clothed in traditional Bedouin wear. Though it was very hot, I was able to rise up on the camel, and run him across the beach. It was one of the most wonderful experiences in my life.



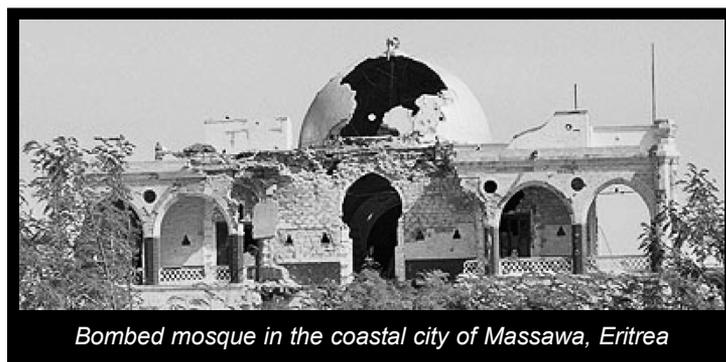
Eritrea – CIA World Factbook 2009

Slightly larger than the U.S. state of Pennsylvania, Eritrea is located in Eastern Africa, bordering the Red Sea, between Djibouti and Sudan.

Never had I been able to say that I had ridden a camel at the Red Sea before! It was surely something that I will remember for the rest of my life.

The most remarkable finding of all was the kindness and generosity of the people of Eritrea. We were invited to many homes of distant relatives and friends who often took the afternoon off work in order to prepare large feasts of beef, lamb, vegetables, and injera, entertaining us the best way that they could. Despite the poverty and political oppression, the spirit and determination of the Eritrean people is not dampened. Indeed, this spirit, fueled by an unwavering religious belief, keeps them unbroken despite their travails.

Being a person of dual heritage, I feel privileged and honored to be considered part of two different yet very interesting races. Being half Eritrean, and visiting this country twice, has been one of the greatest experiences of my life, one that is unforgettable and life-changing. I have been lucky enough to learn about my background, my ancestors – parts of me that, up until my trip, I had no real connection to. Eritrea is a place that



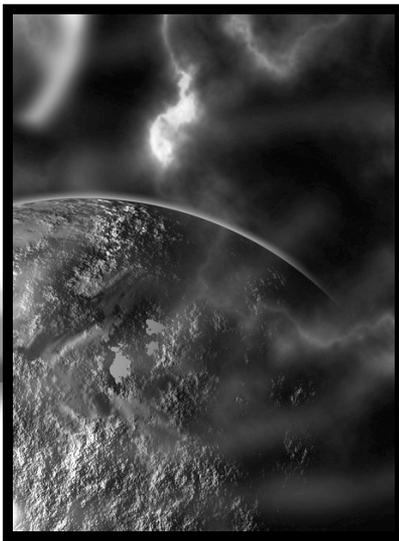
Bombed mosque in the coastal city of Massawa, Eritrea

many would overlook, thinking that this third-world, newly formed country has so little to offer to the world. But this country, while both beautiful and hospitable, has brought me more than just a vacation destination: it has brought me knowledge – knowledge of my past, to help me learn more in the future. 🌐

Lucy Negash is a junior at James Madison High School in Vienna, Virginia. She runs track and field and plays



soccer, while being a member of many clubs and honor societies. She also has a 4.3 GPA, and enjoys being with her family and reading in her spare time. She hopes to attend Stanford University or University of Notre Dame. She plans to major in journalism, and become a news journalist.



Exploring Global Climate Change: Knowledge and Misconceptions in K – 16 Students

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Introduction

Climate change issues are gaining a higher profile for the general public and within K-16 curricula. With the need for changes in consumer choice and lifestyle for citizens in every nation, it is perhaps the younger generation that will be most active in bringing about these changes. For this reason, it is important to determine student knowledge regarding climate change issues. As issues regarding climate change are often complex and interconnected, it is not surprising that student knowledge about this topic is often poor and clouded by misconceptions.

While there have been several studies analyzing misconceptions of students in British public school systems (Boyes & Stanisstreet 1993; Francis, et. al. 1993; Jeffries et. al. 2001), relatively little recent research on climate change misconceptions has been conducted with schools within the United States, particularly on a cross-sectional basis from elementary through university undergraduate students.

Thus, to gauge the extent of possible misconceptions for students from various grade levels, a fifteen item questionnaire was administered to 245 Mt. Pleasant, Michigan students in December of 2008. The sample consisted of 39 completed questionnaires from elementary classrooms, 65 from the middle school level, 47 from high school, and 94 from the university level at both introductory and upper level geography and science classes. To compare our results to previous literature, our study adopts the same survey questions used by British researchers (Boyes & Stanisstreet 1993; Francis et. al. 1993; Jeffries et. al. 2001). Note that they used the term “global warming” rather than the now more accepted term “climate change” to refer to changes in the Earth’s weather and climate due to a buildup of greenhouse gases.

Results

The first five survey statements are directed at the consequences of increased global warming, including statements regarding increases in temperature, more people getting skin cancer, changes in the world’s weather, more people dying of heart attacks, and more deserts.

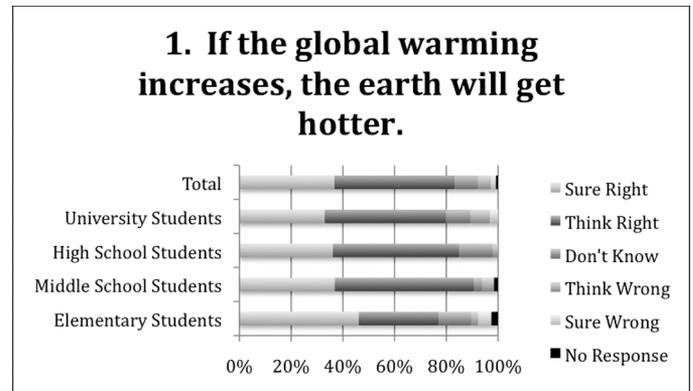


Figure 1

The majority of those surveyed were aware of the fact that if the global warming increases, the earth will get hotter (figure 1). Overall, 84% of those surveyed were either sure or thought the statement was correct. The group of elementary students had a slightly lower percentage (77%) that responded that the statement was right, and also had the largest percentage that was sure the statement was wrong (5%).

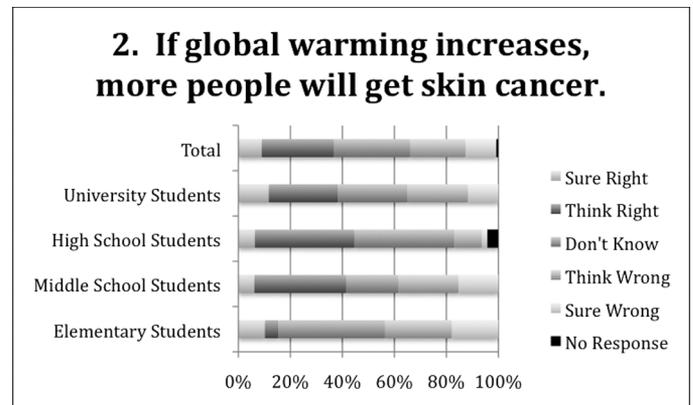


Figure 2

However, when asked to respond if more people will get skin cancer if global warming increases (figure 2), elementary students had the highest percentage (44%) that responded correctly to the fact that the statement was wrong. Does this mean that elementary level students are more

knowledgeable regarding this topic? Possibly, but it seems more likely that elementary students simply associated a negative connotation of global warming (it's wrong) with a negative consequence of skin cancer (it's bad) rather than actually knowing more about the subject. When looking at higher education levels, there are more students that were either sure or thought the statement was correct – this despite students being exposed to more science related instruction. There was also a consistent percentage of students at each level, but led by the elementary group, that did not know whether the statement was right or wrong.

3. If the global warming increases, there will be changes in the world's weather.

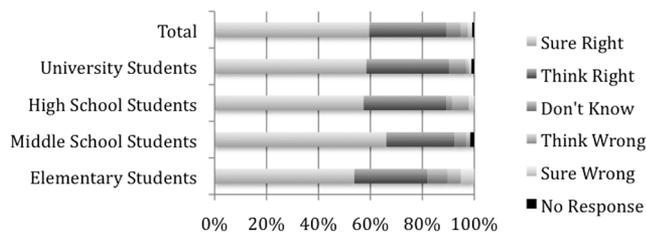


Figure 3

A strong majority (90%) surveyed appreciated that the world's weather will change if the global warming increases (figure 3) and this remained fairly consistent through the education levels. This is one of the few cases in the entire survey where all age groups got it right regarding future climate change. In this regard, teachers need to keep emphasizing that global warming will bring about not only increases in temperature but also greater variations in precipitation and more severe weather, the latter even allowing for periods of *colder* weather.

4. If the global warming increases, more people will die of heart attacks.

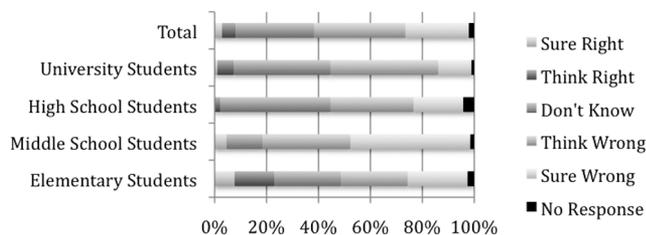


Figure 4

When responding to the statement regarding more heart attack deaths due to the global warming (figure 4), the elementary student group had a relatively large percentage (23%) that were either sure or thought that the statement was correct. This percentage drops dramatically with the older populations. Perhaps exposure to more health related curricula and more sophisticated thinking regarding human health helps students realize that heart attacks are mainly caused by diet and aging as opposed to climate change.

5. If global warming increases, there will be more deserts in the world.

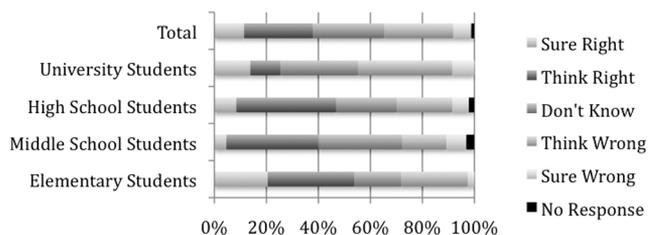


Figure 5

The final statement in this section (figure 5) gauged student beliefs on whether global warming will result in more deserts in the world. The results of this statement were split between right and wrong with around 27% of the total choosing not to respond either way. This demonstrates confusion regarding the causes of deserts and whether global warming increases the extent of deserts. In comparison to the other education groups, the university students had a lower percentage (26%) that responded that the statement was right. As with question two regarding global warming and skin cancer, elementary students actually outperform their university counterparts in correctly answering this question. Again, it's uncertain whether this is due to better education, exposure to fewer curriculum/media related misconceptions, or random, uninformed guessing.

In sum, questions relating global warming to desert expansion and global warming to skin cancer showed evidence of student misconceptions. Most education levels responded correctly to other statements regarding the consequences of increases in the global warming. Patterns could be due to the increased discussion regarding climate change in classrooms or in the case of elementary level students, guessing.

For the next set of five questions, querying students on factors that would cause global warming to become worse, there were more misconceptions. The five statements assessed in this section included global warming becoming worse as a function of holes in the ozone, sunrays getting to Earth, too much carbon dioxide in the air, litter in the streets, and radioactive waste produced by nuclear power stations.

The first statement layer (figure 6) showed that almost 60% of the entire sample incorrectly believed that an ozone "hole" would make global warming worse. (It's ironic that the question itself features a misconception: there is no ozone "hole" but rather a thinning of ozone in the stratosphere). Middle and high school students in particular, held this misconception. This can be due to an overgeneralization between ozone depletion and global warming which both involve the receipt of radiation. The problem is when students fail to differentiate the behavior of incoming shortwave radiation in the stratosphere from outgoing longwave radiation in the troposphere. This incorrect view is also corroborated by the results of question two involving if skin cancer increases with an increase in the global warming.

continued on following page

6. Global warming is made worse by holes in the ozone layer.

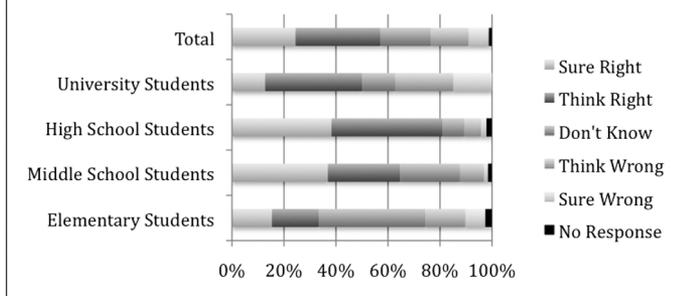


Figure 6

The university student population had more students (37%) respond correctly that they were either sure or thought that the ozone/global warming link was wrong. Perhaps this sample, which received coursework from environmental courses in the geography department and other science classes were able to correctly differentiate ozone depletion from global warming.

7. Global warming is made worse because too many of the sun's rays get to the earth.

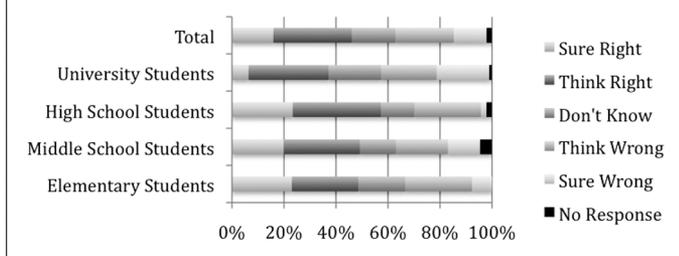


Figure 7

As the greenhouse effect involves retaining infrared energy from the Earth and the creation of a radiation balance in the atmosphere, many students could conceivably believe that global warming is exacerbated by too much incoming solar radiation reaching the Earth. This seems borne out again by question seven (figure 7) relating global warming to the amount of solar radiation reaching the earth. The total percentage of students believing the statement was correct (46%) was fairly consistent through the different age groups. Seeming to lend credence to the positive impact of education upon correct response rate, the university group of students had a higher percentage of those that correctly responded both "sure wrong" and "think wrong."

The majority of students were aware that the global warming is made worse by too much carbon dioxide in the atmosphere. A total of 66% of students responded that the statement was right (figure 9) whereas only 15% believed the statement was wrong. The percentages of students that believed the statement was true increased as the level of education increased, suggesting that students have more information regarding carbon dioxide as a greenhouse gas. However high the overall percentage is, the elementary students had only 31% responding that the statement is

8. Global warming is made worse by too much carbon dioxide in the air.

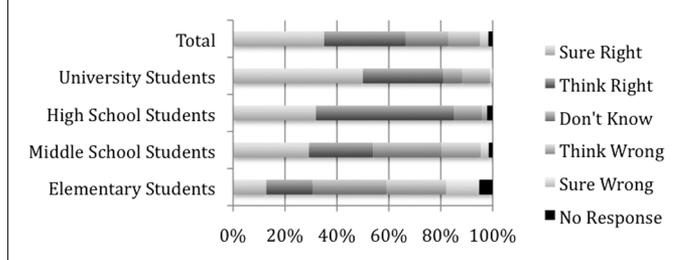


Figure 8

correct. This brings doubt to the idea that high correct response rates by elementary students for the ozone/global warming link are due to being better informed. The carbon dioxide question, after all, is a much more basic question that should be answered correctly if elementary students are indeed better informed than older sample populations.

9. Global warming is made worse by too much litter in the streets.

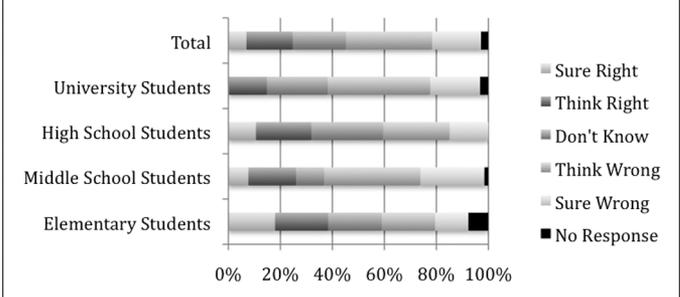


Figure 9

Overall, over half of total respondents believed or knew that the statement tying global warming to litter in the streets was incorrect (figure 9). Elementary students responded equally in almost all response categories suggesting again that many students were guessing at the correct answer and were quite uncertain about the proper response.

10. Global warming is made worse by radioactive waste from nuclear power stations.

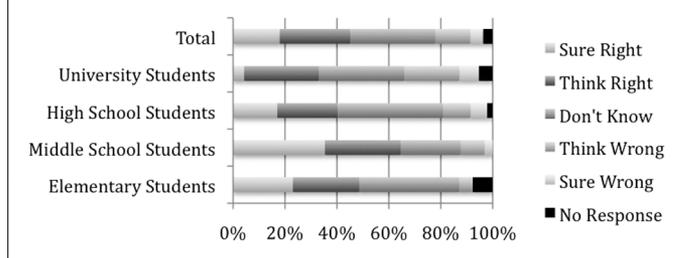


Figure 10

Almost half of all students believed incorrectly that radioactive waste from nuclear power stations would make global warming worse with another third not knowing whether the statement was correct (figure 10).

The percentage of students thinking or knowing that the statement was incorrect was highest for the university population suggesting the influence of increasing education. The overall poor response rate to this question might be a function of “environmental generalization” in which students equate two undesirable albeit unrelated phenomena: nuclear disasters and global warming.

In sum, this section which assessed student knowledge on factors that could exacerbate global warming again showed the continued confusion of global warming and ozone depletion. There is also emerging evidence that increased education does dispel some climate change myths, like the relationship between radioactive waste and climate change and the role of carbon dioxide on climate change.

In the next section regarding how global warming can be lessened, there were a variety of responses demonstrating a number of misconceptions through various education levels. This section includes how global warming can be reduced through the use of nuclear power instead of coal, eating healthier foods, reducing the number of nuclear bombs in the world, making electricity from wind, waves, and tides, and using recycled paper.

11. Global warming can be lessened by having nuclear power stations instead of coal power stations.

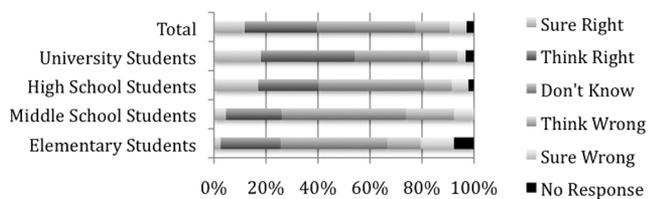


Figure 11

Although it is true that using nuclear power instead of coal would help reduce the global warming, a large percentage overall (38%) did not know the correct response to the statement (figure 11). The observed responses could again be attributed to a negative connotation associated with nuclear energy. The percentage of those that believed the statement was correct increased through the educational groups with the highest (54%) occurring with university students. The “think right” responses are consistent through all the groups, but the “sure right” increases with education.

Most students appreciated the fact that eating healthy foods (figure 12) would not act as a cure for the global warming with 58% responding “think wrong” or “sure wrong.” An interesting point in these responses is that the “don’t know” responses increased through educational level. Conceivably, older students could be lending credence to the idea that greater reliance on organic foods reduces carbon emissions through sequestration or through more energy efficient growing techniques.

Respondents showed a lot of uncertainty on whether reducing the number of nuclear bombs in the world could lessen global warming (figure 13). Still, a majority (53%) of

12. Global warming can be lessened by eating healthy foods.

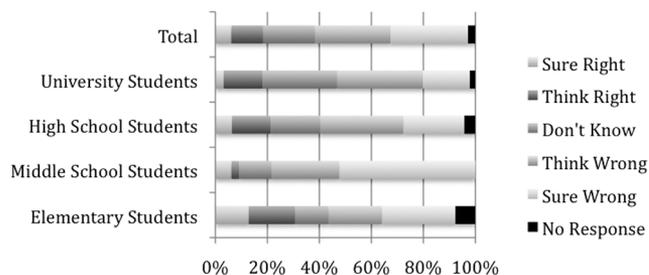


Figure 12

13. Global warming can be lessened by reducing the number of nuclear bombs in the world.

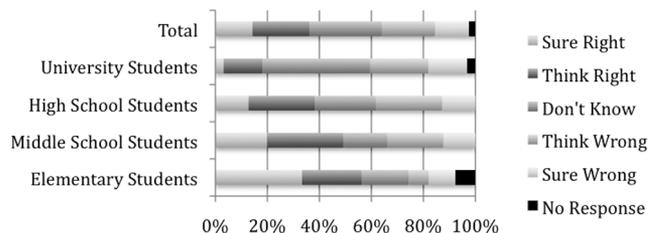


Figure 13

the elementary responses indicated that students believe the statement is correct with this misconception decreasing steadily through the educational levels. As with previous statements regarding nuclear energy, younger students may be generalizing negative connotations with nuclear power to climate change issues.

14. Global warming can be lessened by making our electricity from wind, waves, and tides.

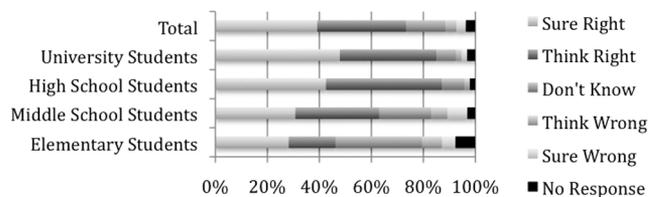


Figure 14

When responding to the statement about making electricity from wind, waves, and tides, each education level population except for the elementary students understood that changing to renewable energy sources would help reduce the global warming. Only 36% of elementary students appreciated that this would help reduce the global warming and 33% did not know how to respond to the statement (figure 14). This percentage of “don’t know” decreased greatly after the elementary level. Over 80%

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of the high school and university level students surveyed responded that the statement was correct perhaps reflecting media attention to alternative energy sources.

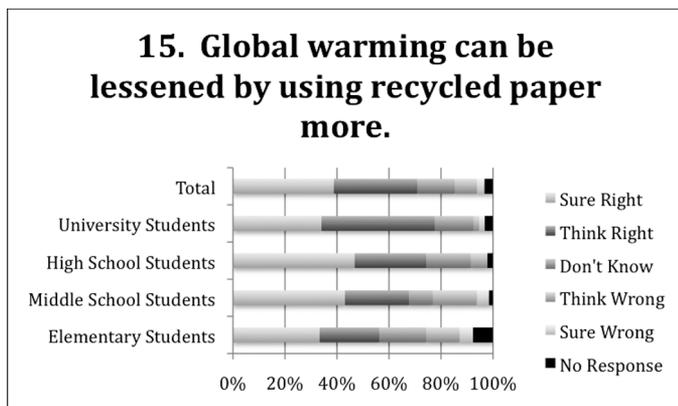


Figure 15

As with obtaining energy from different, renewable sources, most students responded that recycling more paper would help reduce global warming (figure 15). The percentages of students that responded that the statement was right consistently increased through the educational groups with the elementary group having 56% stating it was right (“sure or think right”) and 78% of university students saying it was correct (“sure or think right”). We were surprised that students could make the connection between recycling and global warming given that students would have to recognize the energy savings resulting from less harvesting, processing, and marketing of virgin timber. Also contributing to this response pattern is a positive “environmental generalization” in which a constructive action, such as recycling, is thought to reduce climate change even if the mechanism for doing so is poorly understood.

Conclusions

The results of this study need to be viewed with caution before being generalized to a larger K-16 population. The sample size of 252 students is rather small and was selected on the basis of easy access and cost considerations. In addition, the university student sample may have been better informed than the general college aged population given that they were enrolled in science related classes and surveyed at the end of the semester when knowledge about climate change issues were fairly fresh in students’ minds. Finally, unlike the college population, there was no attempt to account for the extent of climate change instruction occurring at the pre-collegiate level. In other words, there is also no way of knowing the extent to which students were biased by a lack of instruction or poor, misconception-laden instruction.

With these limitations in mind, these results do confirm British research (Boyes & Stanisstreet 1993; Francis et. al. 1993; Jeffries et. al. 2001), indicating that in general (1) Student knowledge regarding climate change issues improve with increasing education; as students proceed

through their education, they appear to accumulate more information and have access to more media coverage that impacts their knowledge and beliefs of climate change. Cases where elementary students outperform older age groups are probably the result of random choice or making the correct choice without realization of the complex processes underlying the selection of the correct choice. (2) Students at all age levels confuse global warming with ozone depletion. It is possible that students relate “holes” in the ozone with higher amounts of sun rays entering the atmosphere and causing more heat and damage to humans (skin cancer). Perhaps students are more aware of current news and information regarding the ozone status and link this news to the increase in the global warming. (3) There is a tendency toward “environmental generalization” whereby the negative connotation associated with nuclear power, through knowledge of past disasters and the destructive characteristics of nuclear bombs, or the omnipresence of litter on the street or in landfills, can be incorrectly linked to climate change; conversely, doing something positive for the environment, like picking up litter or eating healthy, can somehow lessen climate change.

The misconceptions discovered in this study involve students trying to make sense of the complex interactions associated with climate change, processes that simultaneously involve the biosphere, atmosphere, hydrosphere, and lithosphere. Given the complexity of the issues involved, it is no surprise that these misconceptions are usually firmly held and are only relinquished through a variety of teaching techniques involving demonstrations, field trips, multimedia, and critical thinking exercises.

The National Geography Standards, with their emphasis upon human environment interaction, are a convenient starting place for addressing issues of climate change. Another source, *Climate Literacy: Essential Principles and Fundamental Concepts*, developed and endorsed by NOAA, NASA, and NSF (<http://climateliteracynow.org/tiki-index.php>) is a quality resource for any instructor wishing to fortify their knowledge of climate change issues. 🌐

Acknowledgements

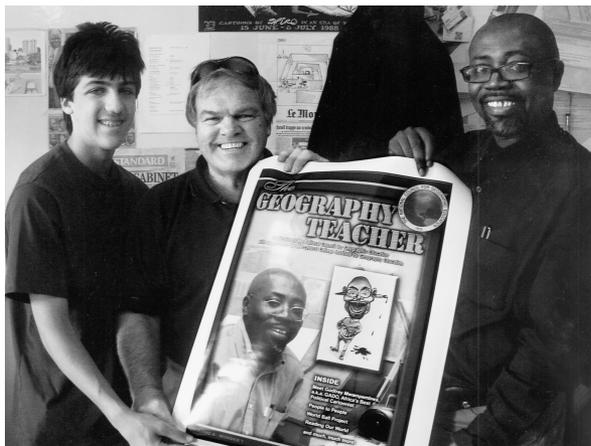
We are grateful to the Central Michigan University Honors Program that helped fund this research.

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Update from last issue

Last issue TGT featured the work of GADO (Godfrey Mwampembwa), a political cartoon commentator who lives and works in Africa. This past summer, Ed Grode, center, and his 13-year-old son Trevor, left, presented GADO, right, with a poster-sized copy of the cover of TGT 6.1 upon which he was featured. GADO now has the most highly-rated television show in Kenya, *The XYZ Show*, patterned after the old British political satire *Splitting Images*. Using expensively made puppets of Presidents Kibaki and Obama, and Prime Minister Odinga, etc., GADO continues to skewer politicians in a new medium. Google *The XYZ Show* to view a clip of sub-Saharan Africa's most talked about new show.



Ida Odinga, wife of Kenya's Prime Minister Raila Odinga, proudly displays a copy of our magazine in the picture on the right. Mrs. Odinga is a former geography teacher who taught courses in the geography of North America.

She recently fulfilled a lifelong dream by visiting Niagara Falls. Mrs. Odinga was a most gracious hostess to TGT on our most recent visit to Nairobi.

Less happy news concerns David Bulambo Bitingingwa, who authored *Why French* in TGT 6.1. He has fled the lack of safety in the Kakuma Refugee Camp and is now an urban refugee in Nairobi. He was recently joined by his wife and newborn daughter, Zoe. Hopefully, the family will now remain safe.

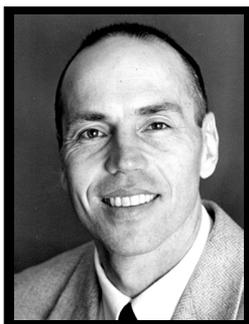
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Jacklyn Welsheimer graduated with honors with a B.S. degree from Central Michigan University and is pursuing graduate degrees at Clemson University. She has dual research interests in science education and human management.



Mark Francek is a geography professor at Central Michigan University. He teaches physical geography, soil science, and earth science education and integrated science education. Mark has research interests in earth science education.



Have you created one of THE WORLD'S GREATEST GEOGRAPHY LESSON PLANS?

The NCGE Publications & Products Committee and the Curriculum & Instruction Committee invite you to submit your best lesson plans for a new NCGE product, **The World's Greatest Geography Lesson Plans**.

Lessons will be made available for a reasonable price as a compilation on a CD or individually on the NCGE Web site. This new product will create a valuable source of revenue for NCGE, so we hope you will send us your all-time favorite lessons—the ones that were so successful that students remember them for years. A committee of experienced geographic educators will select the lessons for inclusion. Credit to the lesson creators will be clearly given. Here are a few guidelines:

- Lessons from all grades K-12 are welcome.
- Lessons must be your own creation.
- If you've borrowed great lessons from colleagues, please ask them to contribute the lessons.
- We welcome both tried-and-true lessons and newer lessons that incorporate technology.
- Cross-curricular lessons are welcome.
- Don't forget to encourage your friends to contribute!

The required lesson plan format and submission instructions are found at www.ncge.org. Contact Judy Dollard at jdollard@everestkc.net or Kristi Alvarez at kalvarez@keene.edu for more information.



Risk Perception and Climate Change

Christina Grunert and Professor Dr. Alexander Siegmund

University of Education, Heidelberg
Heidelberg, Germany

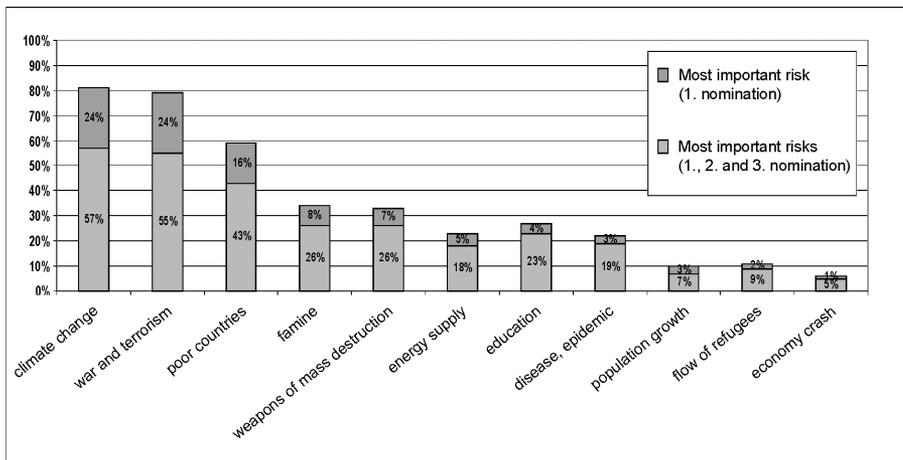


Figure 1: Risk Perception in Germany (2007)

IPSOS 2007

Learning Kit “Risks Resulting from Climate Change”

To answer these questions, teaching concepts and materials for different aspects of global change were developed and published in the form of the learning kit “Risks Resulting from Climate Change” (figure 2). In this manner, scientific competencies can be established and potential environmental fears can be attuned to actual conditions. Until now, five learning kits have already been produced and evaluated at different schools. The project is carried out by the Department of Physical Geography at the University of Education, Heidelberg (Germany) and is accompanied by a dissertation on “perception

of environmental risks resulting from climate change.”

Each learning kit consists of three modules (figure 3, next page): Module One is a material chart with a teacher manual, functional and didactical introduction, lesson plans, worksheets with templates and overhead transparencies, and a bibliography.

The second module is a multimedia presentation on DVD, including pdf-files of the whole material. Beyond that, the DVD



Figure 2: Learning kit “Risks Resulting from Climate Change”

contains an introduction to the background of climate change as well as assorted materials such as films, animations, graphics, and links.

The third module is the most important part of the kit: Introductions and materials for different experiments. The module also contains researcher booklets – one for each student – with instructions for the experiments and for the construction of different models. Additionally, materials which the students need for the experiments are included. For example, there is a model of the greenhouse effect.

Climate and weather belong to the oldest, most common and popular topics humans talk about. With the increasing awareness regarding climate change the global warming is discussed by a broad public. Almost every week the newspapers report on natural disasters in connection with a global climate change: Hurricanes in the USA (e.g., hurricane Katrina), cyclones and floods in southwest and central Asia, or winter storms in Europe (e.g., Kyrill or Lothar). The warming of the climate system is unequivocal, says the Intergovernmental Panel on Climate Change (IPCC 2006). Observations show increases in global average air and ocean temperatures, widespread melting of snow and ice, and a rising global mean sea level.

All these topics are handled in a more or less serious manner by the media and are perceived by a broad public. In a survey that has been published by the German IPSOS institute in 2007, more than 1000 people were asked what they expect to be the most important risks of our time. They were given several items which they had to bring in an “importance-order,” eg. famines, population growth, or economic crash. The majority (24 percent) of the people see climate change as the most important risk and 57 percent see climate change as one of the three main factors closely followed by war and terrorism. The survey shows that climate change is one of our greatest environmental, social, and economic threats (IPSOS 2007). But are these fears justified? How much are we affected? How does climate change – and climate in general – work?

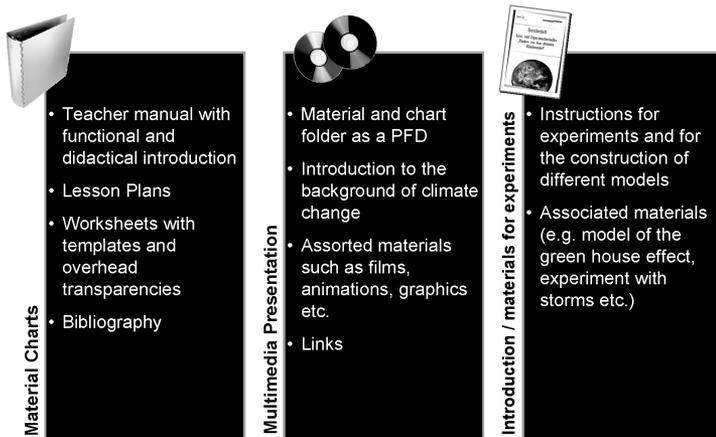


Figure 3: The three modules of the learning kit "Risks Resulting from Climate Change"

Altogether there are 12 learning stations in the form of a learning circle, where the students can make special experiments and learn more about the different aspects of climate change with the help of experiments, measurements, tasks, figures, sample calculations, and so on.

Figure 4 shows some examples for the learning stations. There is a station where the students create rain and learn

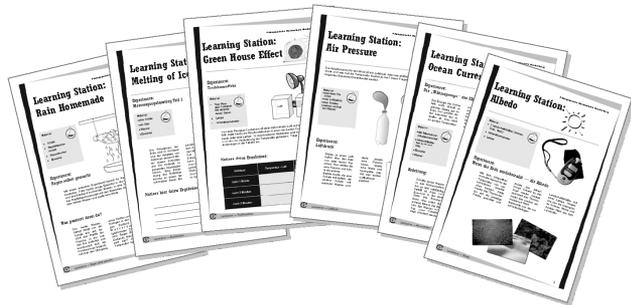


Figure 4: Example pages for the learning stations

more about the process of condensation. A learning station about melting of ice shows the consequences of a global warming for a rising sea level and what this means for people who live on the coasts. One station is about the greenhouse effect. Here the students fill different gases in boxes of Plexiglas and shine on it with a lamp. After one, three, and five minutes they have to measure the temperature in the boxes and write the results in a table that is in the researcher booklet. Another experiment is about the albedo. Here the students can use an infrared thermometer to measure different surfaces, for example, grass, snow, or rock.

The Accompanying Study

In the course of a doctoral thesis that deals with the topic "perception of environmental risks resulting from climate change" it should be found out what the students know and what the students think about the global climate change, if there are any fears or concerns, and if their attitudes towards climate change can be modified by an increase in knowledge.

The study will focus on students of secondary I education (11-15 year olds). In order to detect changes in the knowledge as well as in the perception of different forms of environmental risks, a pretest-posttest-design

was chosen. Students complete a questionnaire before and after working with the learning kit "Risks Resulting from Climate Change." Parallel to this quantitative way, guided interviews are controlling the results from the written tests. The focus is on the question of how far scientific literacy as well as the understanding of ecological correlations can change the perception of risks. The treatment consists of specially developed learning concepts with the focus on the topic of "natural disasters and global change." 🌐

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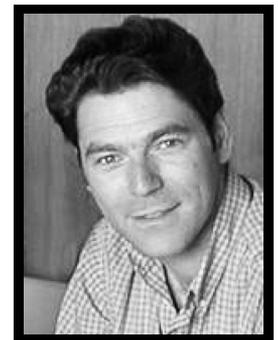
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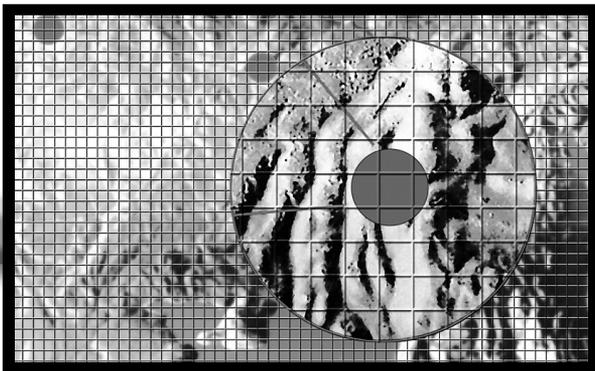


Christina Grunert is a Ph.D. student at the University of Education, Heidelberg (Germany). She works in the fields of risk perception and environmental didactics and is writing her dissertation about the topic, "perception of environmental risks resulting from climate change." She also teaches courses in physical geography for highly talented children

and organizes different scientific events for children (e.g., explore science days or open museum nights). Beyond that she is responsible for the "didactics workshop" of the university's geography department. Information about other modules and the whole project can be obtained by sending an e-mail to grunert@ph-heidelberg.de.

Prof. Dr. Alexander Siegmund is a full professor for Physical Geography and its Didactics at the University of Education, Heidelberg (Germany) and head of the Department of Geography. His research interests include climatology, geomorphology, geoecology, remote sensing, environmental education, and new media. The projects he supervises study middle Europe, the Mediterranean region/Canary Islands, the semiarid subtropical regions in western and central Africa (Cape Verde, Burkina Faso, Cameroon) and Antarctica.





Harvard Revisited

Geography's Return as GIS

Dr. Wendy Guan and Dr. Peter K. Bol

Harvard University
Cambridge, Massachusetts

Editor's Note: In our October of 2006 issue (volume 3, number 2) we had the great pleasure of interviewing Dr. Peter K. Bol, Charles H. Carswell Professor of East Asian Languages and Civilizations, who was named the first Director of the Harvard University Center for Geographic Analysis (CGA). Here is a follow-up concerning how the center has been built up. Our thanks to Dr. Bol for making sure we have received this update.

Center for Geographic Analysis at Harvard University

Operational Model, Achievements and Perspectives

Establishment of the Center

Geographic information systems (GIS) technology is valuable to many disciplines. It provides a framework for organizing our knowledge geographically. It reveals patterns, relationships, and processes, broadens our knowledge, and deepens our understanding. It helps us conceptualize, represent and communicate ideas, reconstruct history, illustrate the present, or plan for the future. In order to harness the benefits of GIS, many universities have established GIS centers.

There are two common models of GIS centers in universities. One is department based, such as the three National Centers for Geographic Analysis (NCGA), the GeoPlan Center at the University of Florida, and the Environmental Resources Spatial Analysis Center (ERSAC) at the University of Minnesota. Departments hosting GIS centers include geography, urban planning, and forestry, among others. The other common model of university GIS centers is library based, or library joined with university IT services. Examples are abundant, such as Stanford University, Yale University, MIT, or Rice University.

Prior to 2006, Harvard University had both models. The Graduate School of Design had been offering GIS course modules as part of its curriculum and spatial analysis support by its IT staff. Meanwhile, the Harvard College Library Map Collection also had GIS staff offering spatial data and GIS support to users across the university. However, Harvard faculty and administrators felt that much more needed to be done to meet future demand for geographic analysis.

To the degree that a department based center is focused on serving the hosting department or school, it may have few resources left for the rest of the university. A library based center serving the entire university may be limited in its service by the operational conventions of

libraries. To overcome these limitations, Harvard University established the Center for Geographic Analysis (CGA) in 2006. The CGA works with both the School of Design and the Map Library, but it has a broader mandate.

At its inception, the CGA was designed to focus on research and education in the field of spatial analysis and geographic information. The Center's goal has been to work with entities across the university to strengthen university-wide GIS infrastructure and services; provide a common platform for the integration of spatial data from diverse sources and knowledge from multiple disciplines; enable scholarly research that would use, improve, or study geospatial analysis techniques; and improve the ability to teach GIS and spatial analysis at all levels across the university. This article briefly reviews the Center's 3-year accomplishments and development trajectory.

Research Services

Help desk

CGA staff offers two physical help desks, one on the main campus; the other on the Longwood medical campus. Both provide a weekly walk-in or scheduled service to anyone with a Harvard University ID. Professors may come to ask questions about where to find data for their research projects, students may come to see a demo on how to do certain spatial analysis, post-docs or research fellows may come to discuss which software package is most suitable to include in their grant proposals. Those who can't come at the pre-scheduled time may email to schedule a one-on-one session. Many use the CGA virtual help desk which guarantees a response to an email or phone call within 24 hours. The number of help desk users has been steadily growing, with a monthly average of about 10 in 2006, 20 in 2007, 40 in 2008, and 60 in the first half of 2009.

Consultation

Many faculty members require more dedicated service than a help desk session. Often CGA staff is invited to attend a project team meeting, review their project plan, examine collected data, and offer advice on how to incorporate geographic analysis into their project at various levels. Such consultation can be a one-time, half-day effort or a series of one to two hour sessions over several months. Like the help desk service, such consultation is provided free of charge.

Project work

When the demand for CGA staff time goes beyond a few hours, the work is managed as a "project." CGA staff will fill out a one-page project specification, documenting the required work, estimated work time, planned deliverable product, deadlines and foreseeable risks, and alternative approaches. The scope also indicates the amount of service, charged at a flat rate of \$75/hour. Work will start when the user approves this project specification. Modifications to this document may be made at any time during the project life span when both parties agree to the changes. When work is completed, CGA staff will send the user an invoice accordingly. For users who don't have enough funding to cover such service charges, CGA offers discounts at various levels. The objective is to offer the most needed service for all, but also to educate users about actual cost of such services, and prioritize CGA staff time to guarantee deadlines for those who have sufficient funding.

Contract management

It is not unusual for a project to require some labor-intensive work, such as massive digitizing of paper maps, repetitive georeferencing of scanned image tiles, or specialized code programming. Such work is outsourced to external service providers. CGA maintains a list of such companies with competitive rates. CGA staff translate research project demands into technical service requirements, negotiate service terms, manage the contract, and perform QA/QC of the deliverables. Products of such contract services are submitted to the Harvard Geospatial Library or the GeoTools portal for sharing according to the nature of the product and the usage permission of the source materials.

Grant proposals

After the initial consultation, researchers may invite the CGA as a collaborator for their project in the grant proposal writing phase. CGA staff may write a section of the proposal, or provide a letter of support and other required contents. In such cases, CGA service charges will be included in the project budget.

Teaching and training

Before the establishment of the CGA, there were a couple of courses in the Graduate School of Design and the Department of Anthropology which had GIS modules. The CGA injected both credit courses and non-credit training programs which are open to all in the university.

For-credit courses

Through the Department of Government, a full-time GIS preceptor offers credit courses to students in the Faculty of Arts and Sciences, the School of Engineering and Applied Sciences, the Harvard School of Public Health, and the Harvard Medical School. About 50 undergraduate students and 85 graduate students have taken these courses since 2006. Six undergraduate students received thesis guidance from the GIS preceptor. CGA staff also added GIS courses through the Harvard Extension School. Available GIS courses in the current school year can be found at this web site: <http://gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page189847>

Non-credit training series

CGA staff also offer non-credit training series that is free and open to everybody with a Harvard University ID. These training sessions are two to four hours long, combining short lectures with several hands-on exercises, aimed at giving students a conceptual introduction and some practical skills in geographic analysis. Topics are demand driven and have been expanding every year (<http://gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page189848>).

Annual thematic workshop

It has become a tradition for the CGA to host a one-day conference every spring. These annual thematic workshops are free and open to all Harvard affiliates with others accommodated as seating is available. The topic is determined by the CGA Technical Advisory Committee, and the event logistics are supported by the Institute for Quantitative Social Science. Some of these workshops were co-sponsored with other Harvard organizations such as the Harvard University Center for the Environment and the Harvard Museum of Comparative Zoology. Presentations on these workshops are made available online for the public (<http://gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page148866>).

Summer GIS institute

In the summer of 2009, the CGA introduced a new training program called the Harvard GIS Institute. This is a two-week intensive training session mainly designed for graduate students and research fellows at Harvard. It includes not only lectures and lab exercises but also guest speakers introducing application cases in various disciplines, tours to GIS-related facilities on campus, student selected projects using GIS, and a one-day mini-conference for the students to present their work. Registration demand significantly exceeded capacity for the summer session. It will be offered again in January of 2010 as an overflow session, and most likely be repeated every summer, if not every winter too, in future years.

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Infrastructure Support

Site license

The CGA took over responsibility for administering the university site licenses under agreements with Environmental Systems Research Institute Inc. (ESRI) and Leica Geosystems. It has since adjusted the GIS site license portfolio, added ArcGIS Business Analyst, Data Interoperability, Idrisi, and Google Earth Pro. The floating licenses are served out from one central server but backed up by several departmental servers. The single use licenses are administered through a standardized procedure with verification of user IDs and signed statement of understanding of the license restrictions. The cumulative usage of the ESRI licenses averages more than 10,000 hours per month, and about 150 copies of single use ArcGIS student licenses were distributed in 2008.

Online data library

The Harvard Geospatial Library (HGL) is a web-based searchable catalog developed and maintained by the Harvard University Library (<http://hgl.harvard.edu>). It contains many kinds of geospatial data, from global elevation information to building footprints to scanned and georeferenced historic maps for cities around the world. Data can be searched by location, subject, author or date, and most of the data can be displayed on screen or downloaded. It includes items from the Harvard Map Collection, data created by the CGA and a selection of records from the Dataverse Network (DVN) at the Harvard Institute for Quantitative Social Science. In addition to contributing data contents, CGA staff are also actively involved in the redesign of the system's user interface, promotion of its usage among Harvard users, and improvement of its interoperability with other Harvard systems such as DVN and AfricaMap.

Hosting of web GIS services

As web mapping technologies have matured, an increasing proportion of service projects designed and completed by CGA staff have resulted in web-based services. A list of such services can be found at this web site: <http://gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page222549>. Some of these services run on the ArcGIS Server platform (e.g., The Fall of the Roman Empire, Chinese Earthquake Web Map), others on Google Map API applications (e.g., The Surgical Safety Web Map, Geographic Location Finder), yet others are run on a specially developed geoportal (such as AfricaMap). Even though most of these applications were developed for Harvard researchers in other departments or schools, many of them don't have the infrastructure and expertise

to host and maintain such services without long-term support from the CGA. The web GIS hosting service from the CGA has turned out to be a welcome and cost-effective way to fill this niche.

GPS and plotting equipments

CGA maintains a series of GPS devices of different accuracy levels and functional specifications. They can be checked out on a first-come first-served basis by people with a Harvard affiliation. CGA staff also publishes best practice guidelines for their field usage and post data processing. In addition, the CGA provides large format map and poster plotting services on a 42" HP DesignJet Z6100 plotter to any Harvard ID holder. The usage is fee based mainly for material cost recovery. It is much cheaper than commercial services of similar kinds.



Computer labs on both campuses

There are 11 computer labs in several schools on both the main campus and the Longwood medical campus that have GIS software installed, and the number is growing. CGA staff provide periodical upgrade media and consultation to these lab managers.

Community Building

Newsletter and web site

The CGA newsletter is published monthly to a listserv of over 1000 subscribers. The listserv is open to the public for self subscription. The newsletters are also published on the CGA web site with a complete archive of all issues. The CGA web site (<http://gis.harvard.edu>) has 57 pages displaying 135 live topics. Many of the topics are updated daily. There were on average more than 800 unique visitors per week in 2008. 3500+ users from 51 countries downloaded materials from the CGA web site in 2008.

Student award

The Howard T. Fisher Prize for Excellence in Geographic Information Science was established in 1999 to promote and reward student work in GIS, from both undergraduate and graduate students at Harvard University, with an endowment from Jack Dangermond (MLA 1969), President of ESRI. Howard Taylor Fisher, geographer and mathematical cartographer, founded the Laboratory for Computer Graphics and Spatial Analysis (LCGSA) at the Harvard University Graduate School of Design (GSD) in 1965 where he developed the synographic mapping system (SYMAP). Currently, the prize is jointly sponsored by the CGA and the GSD. Each academic year, CGA invites faculty or staff members from three or more schools within the university to form the annual Howard T. Fisher Prize Award Review Committee. The Review Committee administers the award process for the year.

Technical seminars

Jointly with the co-chairs of the Harvard ABCD-GIS group, CGA introduces topics and guest speakers for geospatial technical seminars to the Harvard GIS community on a regular basis. Most CGA staff have also served as a speaker at this forum. The seminars are open to the public and generally held at noon on the third Wednesday of the month.

Technical information exchange

CGA staff constantly monitors geospatial technology development trends, new products, new titles, new events, and new data sources. Information is shared with the public through blogs, conference reports, hardware/software/data service evaluations, code sharing, etc. carried on both the newsletters and the web sites.

Collaboration Promotion

Cross disciplinary connections

The CGA's operational model has had a much-appreciated by-product in a highly decentralized university: cross-disciplinary and cross-school connections. People from all parts of the university come to CGA for assistance in finding data, making maps, selecting analytical tools, receiving training, etc. Through broad user contacts, CGA staff often find themselves in a unique position to help make cross-disciplinary connections for scholars. An epidemiologist from the Harvard School of Public Health might be looking for the same census data as a political scientist from the Harvard Kennedy School of Government studying violence; and an entomologist from the Harvard Museum of Comparative Zoology may be interested in building the same digital elevation model and hydrologic network as a historian or archaeologist studying ancient trade routes. Through the CGA, some of them became aware of other's work in the same region of the world, made contacts to each other, shared base data and local data sources, coordinated equipment usage (such as GPS), and some even found other's work inspiring to their own research.

Institutional membership

Representing Harvard University, the CGA manages institutional memberships in geospatial technology and academic organizations such as the Open Geospatial Consortium, Inc. (OGC) and the University Consortium for Geographic Information Science (UCGIS).

Visiting scholars and student interns

Since its establishment, the CGA has housed over a dozen visiting scholars and student interns. Coming from diverse backgrounds and research interests, each has contributed to the CGA operation in a unique way: lecturing on their research projects using GIS, participating in CGA service projects, conducting individual research and producing technology documentation in the CGA's shared technical document archive, developing geospatial tools or designed geodatabases to enhance a module of a CGA system. Through these activities, they also receive GIS training, technical help, review comments, and other input from CGA staff and other scholars and interns at the CGA.

The close interaction in this extended CGA community benefits all participants academically and technically.

Combining "research with GIS" and "research on GIS"

When the CGA was established in 2006, its primary focus was to support research and teaching with GIS, which means using mature GIS technology to enhance research and teaching of all subjects, rather than research on geographic information science itself. However, in doing so, we have found that even though mature GIS technology is far from being utilized at its full potential, there are cases when proven technology falls short in solving a particular problem or providing a particular service. Such unmet needs push the envelopment of geographic information science itself, and inevitably lead us into the research on GIS.

One such challenge is the need for a system that is publicly accessible, simple to use for non-technical scholars, fast in search and mapping speed, and rich in geographic content. Finding no existing tool or system that met this requirement, the CGA has made a particular effort to develop a geoportal, known in its current incarnation as the AfricaMap system.

AfricaMap

AfricaMap is an open source, web-based mapping framework designed to make data on Africa easier to discover and explore. While currently focused on Africa, the technology can be used to organize information for any region of the world, large or small. The system is designed to support very large quantities of data and very rapid and unstructured search, as well as cartographic quality display of multiple layers. The system leverages the vast holdings of the Harvard Map Collection and other sources inside and outside Harvard and attempts to use location as a framework to organize and display research projects and actual data, so that researchers can click on a particular location and find information and data from all recorded projects which describe that geographic location, across disciplines. More information is available from the About tab on <http://africamap.harvard.edu>.

Since the beta version release in November 2008, the CGA has received many requests to clone the system to other parts of the world. Several of these requests are currently under construction, including a Boston Research Map, a Vermont Geological Map, an East Asian Map, and a Harvard Forest Map.

Medieval European civilization

Another challenge has been to completely avoid system development while making web-based mapping an integral part of a series of courses in Harvard's Department of History. The goal is to let students visualize historical places, monuments, excavations, relief, and vegetation of the late Roman Empire. Students use the web map to zoom in, click on a site and see all related information about the place, including listening to the instructor's tour of the monument, site, or excavation, as well as viewing all digital resources, especially photos. This project provides the first

continued on the following page

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high quality digital maps of the Roman Empire and Medieval Europe which are suitable for continuous improvement and adaptation in teaching and research worldwide. The web site below shows just a small portion of what the students use in the classroom, the content of which was developed over several years: <http://cga2.cga.harvard.edu:8399/Roman/>. Even though the performance of this off-the-shelf system still needs improvement, the underlining geodatabase design addressed a number of unconventional issues such as the life span of historical objects and events, uncertainty and nonstandard time definitions, and the verification and consolidation of multi-source scholarly inputs.



Roman Forum, seen from the House of Vestal Virgins

These projects, often started as an application of existing GIS technology, eventually contribute to the geographic information science in many ways. Unlike stable business operations in the industrial or public sectors, academic research in any discipline constantly explores new approaches, new analytical means, and new viewing angles to very diverse objects and processes. They present a strong demand and ample testing cases for the study of new scientific methodology. The CGA is uniquely positioned at the crossing point of research with GIS and research on GIS. It is firmly based on the former, with much potential to grow in the latter.

Future Perspectives

From early 2006 to mid-2009, the CGA has doubled its staff size and quadrupled its office space. Looking into the future, the

physical growth of the Center may be slow in terms of staff, budget, or space, but its service scope and research topics will continue to evolve rapidly. The principle is to effectively respond to demands from the user community.

Based on the input from the faculty steering committee, the technical advisory committee, and the general users, the CGA plans to continue on its current course, which includes expanding in areas most demanded by the users, such as improving and expanding the AfricaMap framework to more regions and use cases, and extending the GIS Institute to a broader audience, eventually including undergraduate students. 🌐

China Historical GIS

Similarly, the China Historical GIS project (<http://www.fas.harvard.edu/~chgis/>) is another example of GIS supporting humanities, which not only applied mature GIS database and mapping technologies to historical data, but also touched on some thorny spatial-temporal modeling issues, such as representing hierarchical relationships of historical administrative units whose polygonal boundaries were never defined or not known, or retrofitting historical population distribution to a finer scale based on modeled natural, economical, and social environment over the historical landscape.

The most active volcano in the continental United States, Mt. St. Helens in Washington state is actually one in a string of volcanic peaks that dominate the Cascade Range. It is a composite, or stratovolcano, which are steep sided, symmetrical, and under pressure. Mt. St. Helens was a beautiful



Mount St. Helens, July 23, 2009. The area still shows many effects of the May 18, 1980 explosion that changed the face of the entire region.

cone shape prior to May 18, 1980, its most famous eruption of the 20th century. In a few short, deadly minutes it went from 9,677 feet to 8,365 feet as the north side cascaded down the mountain, raising the bed of Spirit Lake by 295 feet. This allowed a pent-up dome of magma to explode in a violent lateral blast that leveled forests in a 234-square-mile arc with rock-filled winds as hot as 660 degrees Fahrenheit and pyroclastic flows topping 1,300 degrees Fahrenheit, traveling at 200 mph. The initial eruption lasted nine hours, but the worst damage was done in the first nine minutes, including the loss of 57 people as well as countless plants and wildlife. Its latest eruptions, from 2004 – 2008, were deemed “sluggish but relentless” by those that study such geological features. Current information found at www.mountsthelens.com traces a history of eruption that spans 50,000 years. Besides the Mount St. Helens National Monument, other attractions include a lava tube named Ape Cave, formed approximately 2,000 years ago. Unusual for this type of volcano, it is about an hour’s drive away from the mountain itself. The 30th anniversary of the 1980 explosion approaches. It should always be remembered that geography is a living experience, changeable in the blink of an eye. – CJB for TGT



Photos courtesy of
National Geographic Education Programs

Geography Action! 2009: Help Students See Europe in New Ways

Anne Pollard Haywood

National Geographic Education Programs

National Geographic's 2009 *Geography Action!* program continues its five-year, around the world trek, providing new ways for students to discover patterns and relationships of Europe's human and physical geography. The program engages students in grades K-12 in creating wall-sized maps of Europe using 112 "tiles" – pages downloaded from www.nationalgeographic.com/geography-action.

Activities to go with the wall map of Europe are also available free for download on the web site in the "Mapping Europe" toolkit. Designed to spur geographic thinking, students ask and answer questions such as "Where?" and "Why there?" as they look closely at information about Europe's tourism, energy use, wildlife, and other concepts that relate to places all over the planet. The patterns that students will explore in Europe will help them examine the rest of the world in new ways.

This year's "Mapping Europe" toolkit features five lesson plans outlining activities for use with students in grades K-12. Early elementary students can practice geography fundamentals, including symbols and map keys; relationships between continents, countries, cities; and literacy skills around the language of place. Students in grades four and above have opportunities to map layers of data using choropleth maps, where different shades or patterns represent different values. Students also learn to work with graduated symbols and a variety of data sources featuring Europe around the following themes: animals and protected lands (grades 4-5); tourism and World Heritage Sites (grades 6-8); and energy and environmental issues (grades 9-12). Students work on the tile maps, but teachers or students can also draw base maps of Europe at different sizes using the "projector map." Guiding questions for the activities include the following:

- How do we talk about maps? (grades K-1)
- How do people use maps to learn about places such as the continent of Europe? (grades 2-3)
- What connections are there between protected marine/land areas and the ranges in which Europe's mammal species live? (grades 4-5)
- What are the patterns of tourism and World Heritage Sites across Europe's countries and regions? (grades 6-8)
- What are the patterns of relationships between energy sources and energy consumption in Europe? (grades 9-12)



These activities – with display and analysis of various data layers – simulate what professionals using geotechnologies do every day. Students who grasp the complexities and creativity of these thematic mapping activities will be prepared to try geospatial mapping online or through geographic information systems (GIS). For more ideas on extending the Mapping Europe using GIS, go to <http://edcommunity.esri.com/> 

You can find the map and a teacher's guide on www.nationalgeographic.com/geography-action, along with curriculum ideas from past years focusing on the Americas, Asia, and Africa. Like the "Mapping Europe" toolkit, "Mapping the Americas" also includes tile maps and activities for North and South America.

Educators are encouraged to use GA! Mapping Europe activities

- as collaborative projects in social studies or environmental science classes
- for events celebrating world cultures or Geography Awareness Week
- as hands-on, low-tech GIS Day activities
- in after-school clubs or other extracurricular activities
- as part of Family Geography or International Nights

Reading Our World

The Geography-Literacy Task Force

of the National Council for Geographic Education

Introduction by Elizabeth R. Hinde, Arizona State University

Introduction

Teaching students to think spatially or to see the world through geographic lenses is becoming increasingly vital. Today's students have access to images of and stories about the world like never before. With the tap of a finger they can see a satellite image of the Earth or read a story from a news outlet in Saudi Arabia, for example. The Internet and other informational media (cell phones, satellite television and radio, etc.) are basic features of 21st Century students' lives, and schools must play a key role in helping students understand the images and stories to which they are exposed. In fact, a main purpose of schools has always been to help students to understand and participate in the world around them, both locally and globally, therefore geography is essential in the lives of today's students.

An irony of today's schools, though, is that in this era where students literally have instantaneous information about the world at their fingertips, instructional time in schools spent on subjects that focus on learning about the world – namely the social sciences – has been reduced in recent years. However, there are multiple ways in which creative teachers can help students to learn geographic concepts in the course of a school day. An established method for learning geographic concepts is through the use of children's literature, and children's literature, like images of the world, is more accessible now than ever before as well.

The purpose of NCGE's literacy task force is to help teachers use literature to make connections between geography and reading and writing. That is, to use literature to help students think spatially. This column is intended to provide teachers with lesson plans and ideas for using literature to help students connect geographic concepts to literacy skills. The lesson featured in this column, written by a former 4th grade teacher from Michigan, focuses on a book with the unusual setting of the bottom of the sea near an Inuit village in northern Canada. Through this story and its illustrations, students are given the opportunity to learn about another culture while making connections between literacy and geography.

Very Last First Time Lesson Plan

The *Very Last First Time* by Jan Andrews and illustrated by Ian Wallace describes a special experience of an Inuit girl as she is allowed to collect mussels from the bottom of the frozen sea all by herself for the first time. Although her mother is watching from a hole in the ice above, the girl, Eva, feels a sense of independence as she explores the sea bottom at low tide. The reader is given a glimpse of a most unusual setting that will introduce students to another culture and place.

In addition to an engaging story, the descriptive illustrations provide the reader with information about the context. As Eva collects mussels and explores, readers learn about underwater caves, rock pools, seaweed, tides, and more. In addition, the reader is afforded a glimpse of Inuit culture.

Although there are many possibilities for engaging lessons based on this book, Marty Mater of the Michigan Geographic Alliance developed a lesson based on the five themes of geography that effectively integrates reading and writing with spatial themes about the book. If done well, this lesson will help students think spatially about the story and hopefully about the world around them.

Lesson Plan Implications

Readers of this column may already have a number of plans that apply the five themes of geography to a reading. The themes have become a staple of geography instruction, especially in the elementary and middle grades. Although they have been a part of instruction for over 20 years, it is important to keep in mind that the main purpose of using the five themes is to help students look at the world from a spatial perspective. Hopefully, students will be able to apply the themes to other pieces of literature and to the world outside their window. In doing so, the students will be able to integrate geography into their own thinking processes in other subject areas in school and to their lives outside of school as well, including the images and stories of the world that are at their fingertips.

If you have comments or would like to contribute a lesson plan to this column for possible publication, please contact the author at elizabeth.hinde@asu.edu.

Mission Statement:

"Teachers must be creative if they want to keep geography instruction flourishing in their classrooms. The mission of this task force is to provide classroom teachers with ways to integrate geography and literacy. Ideas will highlight how geographic concepts, skills, and tools can be woven into literacy instruction to provide students with opportunities to develop greater skills in reading, writing, speaking, and listening, while developing a deeper understanding of their world."

Very Last First Time

Book by Jan Andrews, Illustrated by Ian Wallace

Lesson plan by Marty Mater

Teacher Consultant in Residence, Michigan Geographic Alliance

Five Themes of Geography

PLACE

What is it like?

- **physical characteristics**
(landforms, bodies of water, plants, animals, soil, climate)
- **human characteristics**
(culture, bridges, roads, buildings)

LOCATION

Where is it?

Why is it located there?

- **absolute**
(latitude and longitude, address)
- **relative**
(where a place is with respect to other places; e.g. near, far, a short drive, north of)

HUMAN-ENVIRONMENT INTERACTION

How do people interact with and change their environment?

- **human use**
(resources)
- **human adaptation**
- **human impact**

MOVEMENT

How are people and places linked?

- **materials and products**
- **people and living things**
(migration)
- **ideas and information**
(diffusion)

REGION

How can we generalize about the world?

- **physical or natural regions**
(share a physical characteristic or process)
- **human regions**
(share a cultural characteristic or function)
- **composite regions**
(share several characteristics or functions)

Grade Levels 4-6

Subject Areas Geography, Reading, Writing

Duration One to two class periods

National Geography Standards

Element One: The World in Spatial Terms

3. How to Analyze the Spatial Organization of People, Places, and Environments on Earth's Surface

Element Two: Places and Regions

4. The Physical and Human Characteristics of Places

6. How Culture and Experience Influence People's Perceptions of Places and Regions

Element Three: Physical Systems

8. The Characteristics and Spatial Distribution of Ecosystems on Earth's Surface

Element Four: Human Systems

10. The Characteristics, Distribution, and Complexity of Earth's Cultural Mosaics

Element Five: Environment and Society

14. How Human Actions Modify the Physical Environment

Standards for English/Language Arts

1. Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.



Mussels

2. Students read a wide range of literature from many periods in many genres to build an understanding of the many dimensions (e.g., philosophical, ethical, aesthetic) of human experience.

5. Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

6. Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts.

12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

Lesson Overview

In this beautifully illustrated book, Eva, who lives on Ungava Bay in Northern Canada, has her first experience of cutting the thick sea ice and walking by herself on the bottom of the seabed to gather mussels. Students will come to an appreciation of life in the Inuit culture while learning important geographic concepts and reinforcing reading and writing skills.

Purpose

Students will use the Five Themes of Geography to understand this story, and write another adventure in the same pattern.

Objectives

- Students will locate Ungava Bay on a map of Canada.
- Students will describe the setting of the story using the Five Themes of Geography.
- Students will describe ways Eva and her family adapted and depended on the environment.
- Students will write an adventure story illustrating human/environment interaction.

Vocabulary

Mussels – an edible shellfish

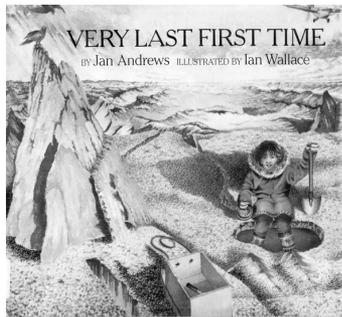
Inuit – indigenous people who live in the Arctic areas

Tundra – a treeless plain

Tides – ocean surface water rising and falling twice daily and causing changes in the depth of water

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Materials/Resources

- *Very Last First Time* by Jan Andrews, Illustrated by Ian Wallace; hardcover, 32 pages. Groundwood Books, January 31, 2003 ISBN-10: 088899043X ISBN-13: 978-0888990433
- Five Themes poster and definitions (available from many sources)
- blank bingo cards
- map of Canada

Procedures

1. Pre reading activities: Using a map of Canada, locate Ungava Bay, on the Hudson Bay. Discuss and review the vocabulary.
2. Read *Very Last First Time* to students, showing pictures to enhance the imagery used by the authors and experienced by Eva.
3. Review the Five Themes of geography, using the definitions and poster. Have students

make a nine square bingo card, placing one of the sub-concepts at the top of each box (see example).

4. While reading the book a second time, have students write evidence of the sub-concepts they have on their cards, trying to get a different answer for each box.

5. Share answers while discussing the book. Some starter questions:

- a. How did Eva and her family depend on the environment?
- b. What would Eva have to know about tides in order to be successful and safe in collecting mussels?
- c. Were you surprised that the moon was out when her mother came to get Eva? What did that tell you?
- d. Why would the sound of the tide scare Eva?
- e. Did this story happen in the past or in modern times? What evidence helps you answer that question?
- f. How did the author and illustrator show that Eva had an imagination?

6. Eva used the physical characteristics of her environment to meet her needs. The author used the environment to write about her adventure. Ask students to think of a way someone uses the environment to survive or to enhance quality of life. Using the guidelines in the rubric, write an

adventure based on this premise. Steps might include:

- a. Choose a setting for the story and describe it using some of the sub-concepts of the Five Themes.
- b. Choose an action for the character(s) that uses the environment to meet a need and results in a problem or danger.
- c. Using the characteristics of the environment, explain how the character(s) come to a resolution.

Assessment

- A completed bingo card, correctly describing the sub-concepts of the Five Themes from the story.
- A well-written adventure story, including at least a 2 on each of the requirements on the rubric.
- Optional: Short quiz on how the Five Themes are used in the story.
- A completed bingo card, correctly describing the sub-concepts of the Five Themes from the story.
- A well-written adventure story, including at least a 2 on each of the requirements on the rubric.
- Optional: Short quiz on how the Five Themes are used in the story. See following page for quiz and examples. 🌐

Downloaded by [Harvard College] at 06:40 18 April 2012

Sub-concepts to be used on the bingo card:

- Absolute Location
- Relative Location
- Physical (Natural) Characteristics
- Human (Cultural) Characteristics
- Use of Resources (depending on the environment)
- Adaptation to the Environment
- Human Impact (changing the environment)
- Movement of Air, Water, Earth (materials)
- Movement of Goods and Services (transportation)
- Movement of People (migration)
- Movement of Ideas (communication)
- Physical (Natural) Region
- Human (Cultural) Region

Example Card: (Example answers)

Absolute Location <i>Ungava Bay</i>	Physical Characteristic <i>Tundra Bay Seabed Thick ice Mussels Rock pool Tides</i>	Movement of Goods <i>Sleds Mussel pan</i>
Human Characteristic <i>Houses Village boats</i>	Use of Resources <i>Mussels seabed</i>	Relative Location <i>Northern Canada tundra</i>
Physical Region <i>Tundra Bay</i>	Movement of People <i>Snowshoes Walking Snowmobile tracks</i>	Adapting to the Environment <i>Warm hoods</i>

Rubric for Geographic Adventure Story:

0 points	1 point	2 points	3 points
Setting: not included or is poorly described.	Description of setting includes some evidence of physical and human characteristics of place.	Description of setting includes evidence of location and physical and human characteristics of place.	Description of setting includes evidence of location and physical and human characteristics of place and a connection between these characteristics and the action of the characters
Purpose of action is not well explained.	Actions are described as meeting a need	Actions of characters are loosely tied to physical and human characteristics of place and location	Actions of the characters are clearly dependent on the description of the environment
Plot: An adventure is not included.	The plot includes a possible problem, but it is not well described or resolved.	The plot includes a problem and a resolution.	The plot includes a well-described problem involving the environment, and depends on characteristics of the environment to come to a resolution.

Geography Quiz on *Very Last First Time*

- An example of relative location would be:
 - Ungava Bay
 - Northern Canada
 - Warm hoods
 - No highways
- All of the following are examples of physical characteristics EXCEPT:
 - Tundra
 - Seabed
 - Mussel pan
 - Snow
- Movement of ideas is shown by:
 - Lighting a match
 - Making a hole in the ice
 - Shrieking ice
 - Greeting their friends
- The tundra is an example of:
 - Movement of goods
 - Movement of ideas
 - Physical region
 - Human region
- Eva adapted to the environment by:
 - Talking with their friends
 - Dressing warmly
 - Following the snowmobile tracks
 - Singing
- Evidence of movement of materials (air, earth, water) is shown by:
 - Tides
 - Shadows
 - Matches
 - Highways
- Eva and her mother used tools such as an ice-chisel and a shovel. This was possible because of:
 - Relative location
 - Movement of goods and services
 - Physical regions
 - Adaptation to the environment
- All of the following are examples of human characteristics EXCEPT:
 - Inuit people
 - Snowmobile tracks
 - Homes
 - Snow

Answers to Geography Quiz:

1. b; 2. c; 3. d; 4. c; 5. b; 6. a; 7. b; 8. d

Marty Mater has served as the Teacher Consultant in Residence for the Michigan Geographic Alliance since 2000. She has 25 years of elementary



teaching experience, including 12 years as coordinator and coach of Odyssey of the Mind for Ovid-Elsie Schools. Besides curriculum planning and professional development, she enjoys her 6 children and 10 grandchildren and traveling with her husband John.

Elizabeth R. Hinde is an Assistant Professor of Teacher Preparation in the College of Teacher Education and Leadership at Arizona State University,



Glendale, AZ. She can be contacted at Elizabeth.hinde@asu.edu

Get the Discussion Started

Photos to Stimulate Thought

Ed Grode



Teachers looking for ways to start class discussions that provoke serious thinking for older students may wish to consider pictures such as these three shown here. The picture on the right, a boy who was in a Beijing park playing with friends, has provoked comments such as “it disgusts me that someone would let that boy have a gun. Where are his parents?” But what if that toy gun was a squirt gun, and the boy was at any neighborhood pool?

The one above may instigate immediate response or may need prompting – where, for instance, is the sign located, what country, what building? Does that make a difference?

What if it said “women only?” Does that make a difference? What if it singled out one race, or singled out hair or eye color? What then? Would it change, depending on who is being asked from what country or town?

Since “9/11” not a lot seems to be said positively concerning the Muslim faith, hijacked by terrorists using Islam to justify their political goals. Prior to this time, Muslim was known as one of the world’s great religions. The picture below, taken in Nairobi, often creates wonderful conversation about what is okay for one type of religion, but not so accepted in others, and why. This can lead to discussions about discrimination in various parts of the world as well as at home.

TGT invites you to use these pictures, find others, copy them and see what gets talked about in your class. 🌐

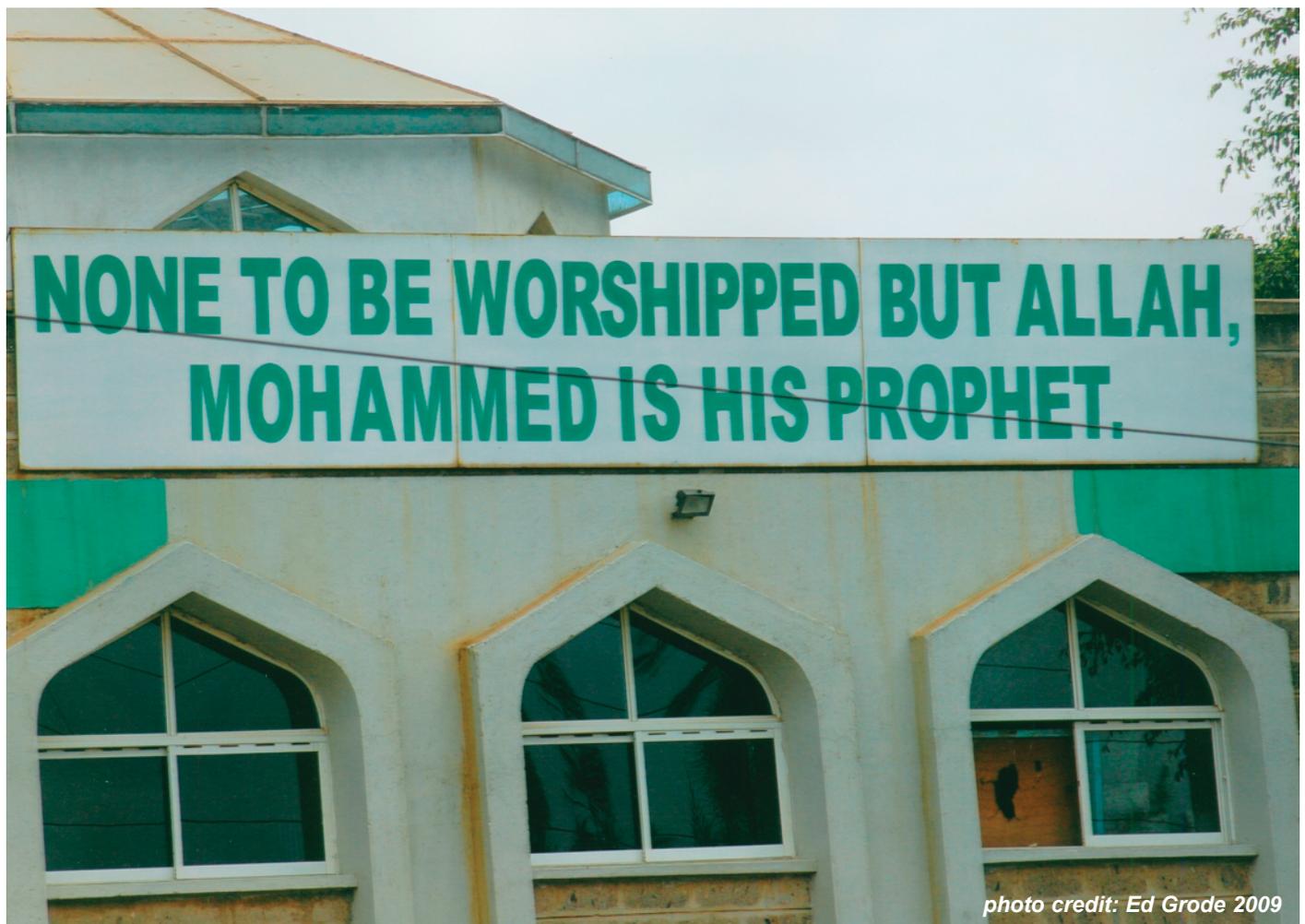


photo credit: Ed Grode 2009

For suggested points of discussion concerning Islam, see page 48

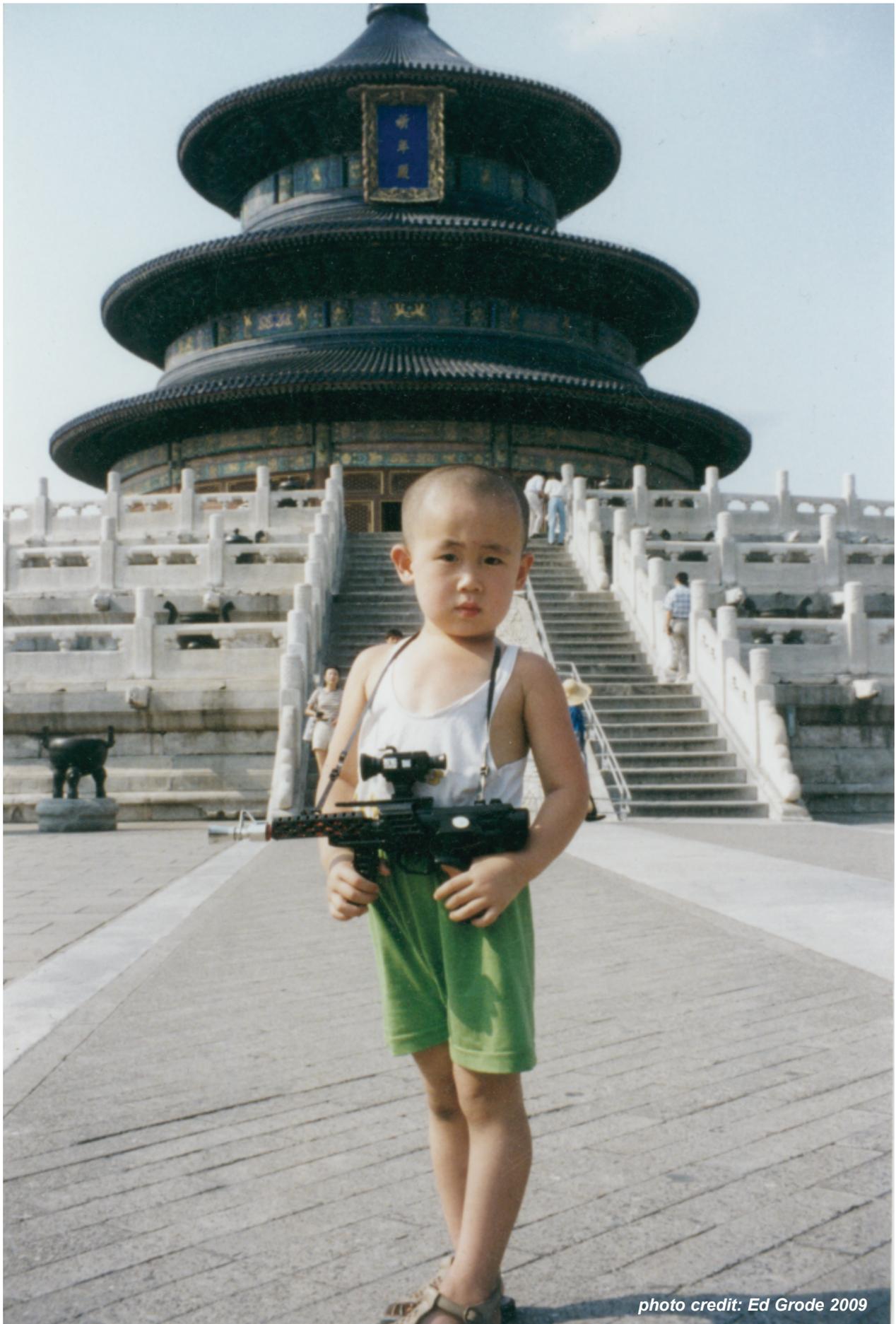
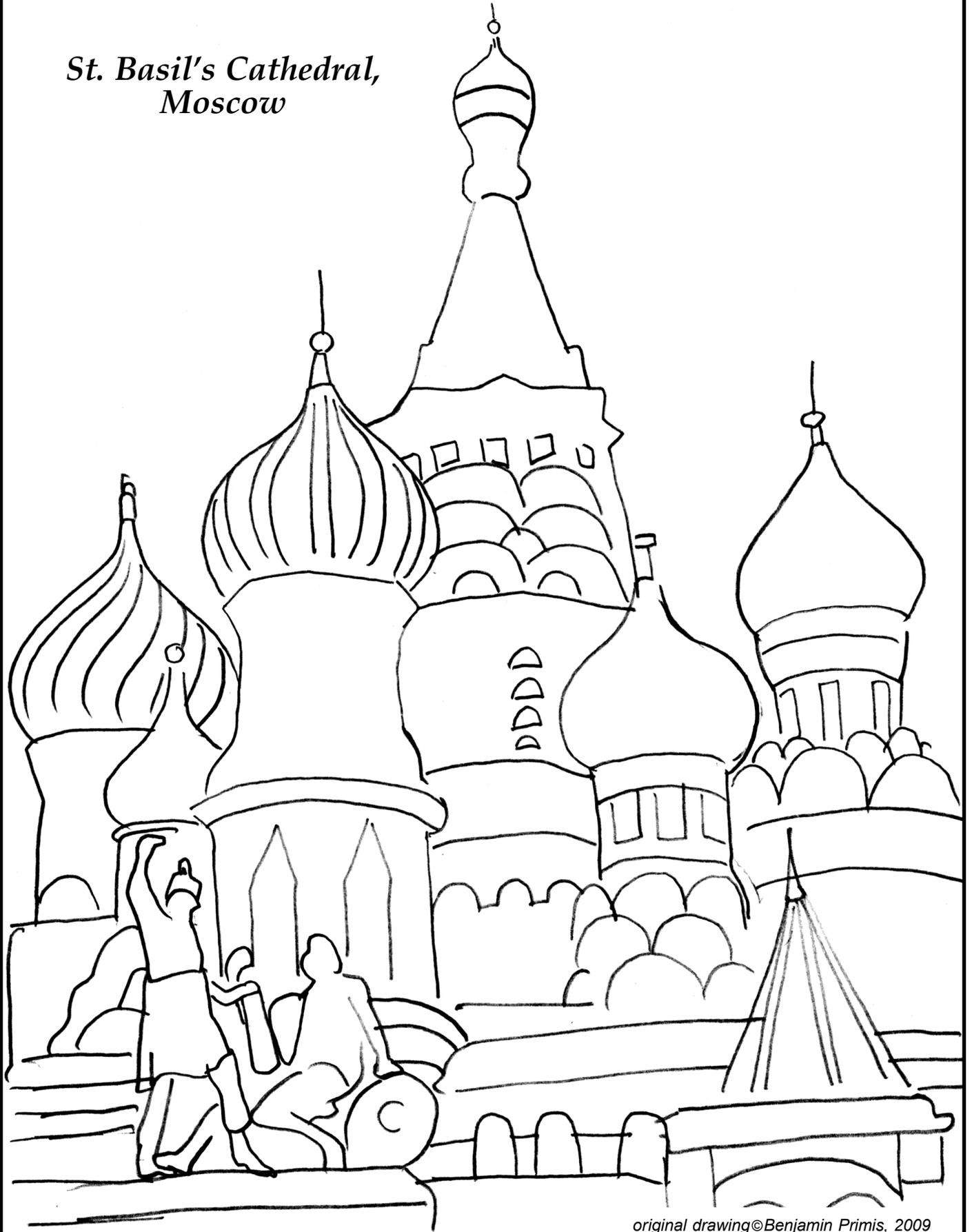


photo credit: Ed Grode 2009

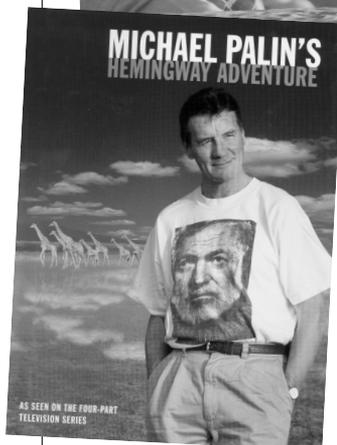
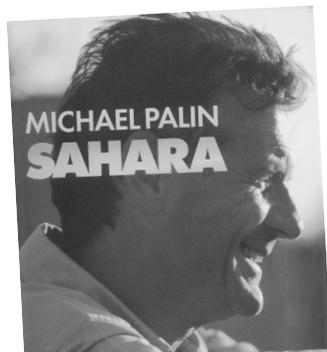
Coloring Page!

*St. Basil's Cathedral,
Moscow*



original drawing©Benjamin Primis, 2009

News in the World of Geography



Michael Palin, of Monty Python fame as well as many different films, is also an avid fan of geography, and has recorded many adventures around the world and written books on the subject. He will now be heading England's prestigious Royal Geographical Society, founded in 1830, having taken the position of president this past June. He'll have his work cut out for him, at least for a time. Two sides of the organization have disagreed about where the focus should go – research or expedition – and he'll no doubt work to bring them together. According to Palin himself, one of the reasons he was sought out to take the position was to have as president someone who would communicate an enthusiasm for geography. As the idea of popularizing geography has always been very important to Palin, and as it was something he felt he could do, he said yes. The web site of the Royal Geographical Society (www.rgs.org) reports that there has been an upswing in students taking the higher A-level courses, with 30% of those students attaining the highest marks. Hopefully, the United States and other countries can promote renewed interest in this absorbing subject as well. – CJBL for TGT

St. Basil's Cathedral, Moscow

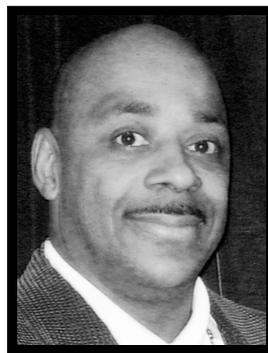
St. Basil's Cathedral, originally called Cathedral of the Intercession of the Virgin on the Moat (after a moat that ran bedside the Kremlin), is probably the most recognized building in Russia and is an international symbol for the nation and for the city of Moscow. It was almost immediately referred to as St. Basil's for Basil the Blessed, "the holy fool" who was hugely popular with Muscovites and Ivan the Terrible himself. Located at the southeast end of the Red Square, it is frequently confused with the Kremlin, which overlooks it.

The cathedral was commissioned by Ivan the Terrible to commemorate successful military campaigns and was built from 1555 to 1561. A popular historical legend says that Ivan had the architect, Postnik Yakovlev, blinded to

prevent him from building a more magnificent building for anyone else, but in fact the architect built a number of other beautiful churches after St. Basil's.

St. Basil's has narrowly escaped destruction through the years – legend says that Napoleon wanted to blow it up when he had to retreat and could not take it back to Paris, except a sudden rain shower put out the fuses on the gunpowder. Stalin cancelled a plan for demolition to open the passage wider from the Red Square for parades when an architect and devotee of Russian culture named Baranovsky threatened to slit his own throat on the steps of the church – he received five years in jail; however, the cathedral still stands and is considered Moscow's most famous and perhaps most beautiful building. 🌐

Ivan the Terrible, first Czar of Russia, was a powerful man but a conflicted killer in cold blood. In 1581, he accidentally murdered his oldest son and namesake during an argument over his son's wife's clothing. It was an awful blow in an awful life. In remorse Ivan compiled a list of names of his victims, a list that grew to over 3,000 before his death in 1584. Donations and copies of the list were sent to Russia's principal monasteries with instructions that prayers should be offered for their souls. He is buried in Archangel's Cathedral of the Kremlin with his sons Ivan and Theodore.



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Oh, the Places You'll Go: Place Collectors, Peak Baggers, and Letterboxes

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Interest in discovery and exploration has been a significant force throughout human history. Motives underlying exploration have ranged from religious beliefs to conquest, the establishment of trade routes, or the accumulation of wealth. More recently exploration has been driven by scientific research and the quest for fame and admiration. During the late 1800s, mass communication and media, especially large circulation newspapers and magazines, piqued public interest in exploration and discovery. Stanley's search for Livingstone in Africa was closely followed by newspapers while Peary's expedition to the North Pole captivated the public's imagination, affirming that humans could travel anywhere on the Earth's surface. Women explorers were also recognized for their contributions to exploration and discovery such as Annie Peck Smith, the first to ascend Mt. Huascarán in Peru. Expeditions to remote areas such as the Gobi Desert, Amazon River Basin, and the world's highest peaks were financed by wealthy benefactors or learned organizations such as the Royal Geographical Society. The exclusive Explorers Club, founded in New York in 1904, provided a gathering place for "gentleman adventurers" to exchange stories or show trophies illustrating their journeys. Club members included President Theodore Roosevelt, Antarctic explorer Ernest Shackleton, and Everest climber Edmund Hillary.

Place Collecting

Although every region of the world has been explored and nearly all habitable areas settled, people continue to be captivated by the concept of exploration. Evidence can be seen in the popularity of expedition travel packages. Nearly anyone with the financial means can fly to the North Pole, sail to the Galapagos Islands, or trek into an Indonesian jungle. Many seasoned travelers take pride in their personal "collections" of places visited as displayed in photographs or systematically marked on wall maps or within dog-eared atlases. Place collecting has been extended to include roads driven, cities visited, and stops at sites of personal interest such as stadiums, lighthouses, or historical districts. Some belong to formal organizations. Established in Los Angeles in 1954, the Travelers' Century Club is open to individuals who have visited at least 100 countries. Members earn distinction for reaching various country-counts with "silver" membership for 150 countries visited, "gold" for 200, and special awards for those who

reach 300 countries. Less exclusive is the Extra Milers Club whose members seek to visit all 3200+ U.S. counties or county equivalents within their lifetime. "Extra Milers" record their progress by coloring maps and sharing stories and photo albums at annual meetings.

Other place collectors target specific geographic locations such as the highest or lowest place in a country. Members of the Highpointers Club are dedicated to visiting the highest point within each of the 50 U.S. states. Others called "peak baggers" log successful ascents of summits over a minimum height. The Colorado Mountain Club maintains a list of more than 1000 persons who have climbed all of the state's 14,000 foot peaks (Table 1).

Mt. Elbert	Mt. Massive	Mt. Harvard	Mt. Lincoln
La Plata Peak	Uncompahgre Peak	Crestone Peak	Castle Peak
Grays Peak	Mt. Antero	Torreys Peak	Mt. Wilson
Quandary Peak	Mt. Evans	Longs Peak	Mt. Princeton
Mt. Shavano	Crestone Needle	Mt. Belford	El Diente
Mt. Yale	Mt. Bross	Kit Carson Mtn.	Mt. Sneffels
Maroon Peak	Tabeguache Peak	Mt. Oxford	Snowmass Mtn.
Mt. Democrat	Capitol Peak	Pikes Peak	Mt. Missouri
Mt. Eolus	Windom Peak	Mt. Columbia	Handies Peak
Humboldt Peak	Mt. Bierstadt	Sunlight Peak	Little Bear Peak
Culebra Peak	Ellingwood Point	Mt. Lindsey	Wilson Peak
Mt. Sherman	Redcloud Peak	Pyramid Peak	Mt. of the Holy Cross
Wetterhom Peak	North Maroon Pk.	San Luis Peak	
Huron Peak	Sunshine Peak	Blanca Peak	

Table 1. "Peak Bagging": Colorado Peaks Over 14,000'

The height of what is considered a peak worthy of climbing varies depending on location. Two clubs in the eastern U.S., the Four Thousand Footer Club, and the Catskill 3500 Club maintain summit lists for mountains that seem modest in elevation compared to the Rocky Mountains. Likewise peak baggers in Britain's Lake District National Park climb summits with comparatively less topographic relief (Table 2). Organizations such as the County Highpointers Association and America's Roof maintain web pages with highpoint coordinates as an aid to peak baggers and place collectors. In recording a visit some organizations accept a member's word while others require submission of latitude, longitude and elevation coordinates along with a description of the site or photograph. Organizations such as the Sierra Club and Boy Scouts of America offer recognition to individuals who have successfully climbed 5, 10, 20 or more peaks.

Height in Feet	Name	Height in Feet	Name
3,210	Scafell Pike	3,033	Helvellyn Low Man
3,162	Scafell	3,023	Ill Crag
3,118	Helvellyn	2,984	Great End
3,054	Broad Crag	2,960	Bowfell
3,054	Skiddaw	2,949	Great Gable

Table 2. Peak Baggers List of the Ten Highest Peaks in the Lake District

Some place collectors focus on visits to cultural, historical or other points of interest such as sport stadiums, ethnic restaurants, or military sites. In 1985 the Eastern National Park and Monument Association began selling a "passport" used to collect ink stamps available in visitor centers at each U.S. National Park Service site. With dozens of franchises located in cities all over the world, some travelers attempt to visit every Hard Rock Cafe.

There comes a time in every rightly constructed boy's life when he has a raging desire to go somewhere and dig for hidden treasure.

Mark Twain in Tom Sawyer

Another type of place collector is less interested in familiar regions or sites, focusing instead on locations identified on the British Ordinance Survey, U.S. Geological Survey or similar maps. Benchmark hunting involves using a Global Positioning System (GPS) receiver or written directions to locate surveyor's monuments such as triangulation or traverse stations. The locations are typically marked with a metal plate embedded within a large rock or attached to a rod driven into the ground. The location of large objects identifiable on maps such as water towers, smokestacks, and steeples may also be captured. Some benchmark hunters photograph both the marker and the view from the location to document their visit. Another group of place collectors visit tri-state corners, defined as the location where three U.S. states come together such as Montana/Idaho/Wyoming or Texas/Arkansas/Louisiana (Parsell 2002). There are 62 tri-corners in the United States including the familiar Four Corners where Colorado, Arizona, Utah, and New Mexico join at a single point inside the Navajo Indian Reservation.

The Internet has opened possibilities for coordinated projects to collect places. Organized in 1996, the Degree Confluence Project is an international effort to visit and document each latitude and longitude integer degree intersection over land (i.e., 37°N, 95°W) as an organized sampling of the World. To qualify as a successful visit a contributor must be physically located on the ground within 100 meters of the confluence. Documentation of confluence visits must include photographs taken in several directions posted to the project's web site



Benchmark, Cape Royal, north rim of the Grand Canyon

(www.confluence.org). Confluences over ocean areas have been left out of the sampling scheme along with some confluences poleward of 48° latitude where meridians begin to converge. Project participants have already completed large sections of North America, Asia, Europe, and South America including several antipodes (points on the Earth's surface that are directly opposite of each other; Figure 1 below).

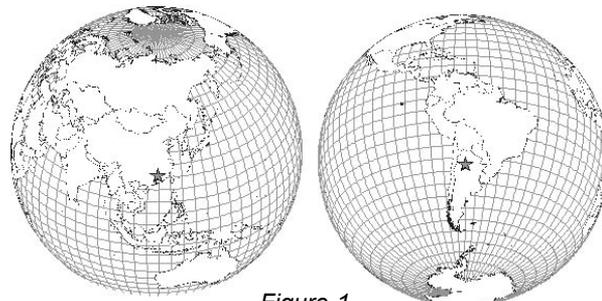


Figure 1.

26°S, 66°W 1.2 miles NW of San Antonio, Salta, Argentina (right)
26°N, 114°E 5 miles NE of Longxi, Hunan, China (left)

Location Gaming

In contrast to place collecting where the goal is to reach a list of known places or positions, location games involve visits to places of no special significance. Among the oldest type of location game is letterboxing, credited to James Perrott of Chagford, England. In 1854 Perrott hid a card with personal information in a bottle on the banks of Cranmere Pool in present-day Dartmoor National Park near Devon. The park is familiar as the site of Sir Arthur

Conan Doyle's *The Hound of the Baskervilles*. Perrott encouraged others to locate the bottle using a set of written clues he distributed. Soon others began hiding their own letterbox messages. It is estimated that there are now more than 10,000 and possibly as many as 40,000 letterboxes hidden within park boundaries. Some letterbox clues are available only by word of mouth while others can be found in guidebooks developed by local letterboxing clubs. The *Catalog of Dartmoor Letterboxes* produced and copyrighted by A.R. Moore (2000) includes a list of several thousand letterboxes in Dartmoor. Since 1998 the

Internet has been the most popular source for obtaining letterbox clues. Clues are sometimes straightforward, referencing map coordinates or landmarks; in other cases they are cryptic (Figure 2).

**Sam & Dukes 3rd Dartmoor Letterbox. 1998
No. 26873. NGR 5585069916. Centre of dam
202.5°. HP Sheepstor 161°. Under rocks at base
of 3 trees, 2 of which are dead.**

Figure 2. Sample Clue, Letterbox No. 26873, Dartmoor National Park

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Most require the use of a map and skills in triangulation, pacing, and map reading. Letterboxes are sometimes found within a tree stump or beneath a pile of rocks. When a box is discovered the finder makes an ink imprint of his or her personal stamp on a logbook stored inside the letterbox (Figure 3). Likewise a unique stamp held inside



Figure 3. Example of Dartmoor Letterbox Stamps (provided by the author)

the letterbox is used to make a record of the find in the hunter's personal logbook. A Dartmoor tradition is for individuals to keep the design of their personal stamp a secret.

There are portions of the Moor where it is possible to locate 20-30 boxes in a single day. In addition, many pubs in the area have a box behind the bar. A letterboxing milestone is achieving 100 letterbox stamps, making the collector eligible to join the "100 Club" (current membership stands at 13,000). The club meets twice each year at an event called "The Meet" held at Lee Moor Public Hall. Some well-known letterboxes at Dartmoor have become landmarks featured on British Ordinance Survey maps. One of these is the site where Perrott left his bottle, now marked by a granite pillar with an iron door containing a visitor's book and stamp.

Letterboxing wasn't well known outside of Great Britain until the publication of a 1998 article in *Smithsonian Magazine*. Since that time it has become increasingly popular throughout the United States and Canada. About 5000 letterboxes are estimated to be hidden in North America. The Internet plays an important role in disseminating clues about the location of North American letterboxes. American letterbox hunters use a shorthand code following their email address to show how many boxes they've planted (P) or found (F). For example, the code P16F38 indicates that an individual has planted 16 letterboxes and found 38. In some cases a number may also be included after an "X" to indicate the number of personal stamp exchanges made with other letterboxers encountered or "E" for letterbox events attended. A North American innovation is a portable letterbox called a "hitchhiker" or a "parasite" hidden within another letterbox. The finder is instructed to report the hitchhiker's location on a web site before hiding it inside a new and undisclosed letterbox. In this way the movement of the hitchhiker can be tracked.

Geocaching is a rapidly expanding variation of letterboxing. The earliest reference to this game was called "The Great Stash Game" by Dave Ulmer of Portland, Oregon. In May 2, 2000, Ulmer posted an Internet message noting possibilities for using Global Positioning System receivers for finding hidden "stashes." A short time later the game became popularized under the name "geocaching" for *geography* and *caching*, meaning something to be discovered. Like letterboxing, geocaching involves a search for containers but clues are based on GPS coordinates instead of landmarks and compass bearings. Instead of holding rubber stamps, geocaches may contain music CDs, small toys, and nonperishable food items. Players who take an item from a cache are expected to leave something in its place for the next finder. A logbook stored within the cache is used to record the name of visitors. Sometimes caches contain a disposable camera to enable the finder to record a photograph of themselves. A few caches contain directions to find other caches. There are currently more than 58,000 geocaches worldwide with about 74% located within the United States. Following the United States, the largest number of caches are in Canada, Germany, the United Kingdom, Sweden, Australia, and the Netherlands (Table 3).

Country	Caches	Percent
United States	43,241	73.0
Canada	3,403	5.8
Germany	2,104	3.6
United Kingdom	1,912	3.2
Sweden	1,472	2.5
Australia	1,454	2.5
Netherlands	574	1.0

State	Caches	Percent
California	6,663	15.4
Washington	2,149	5.0
Oregon	2,066	4.8
Texas	2,046	4.7
New York	1,919	4.4
Utah	1,705	3.9
Arizona	1,534	3.5

Source: www.brillig.com/geocaching
World total = 58,754

Table 3. Countries and U.S. States with the Largest Number of Caches

Similar to geocaching, geodashing uses GPS receivers on a playing field that encompasses the entire land area of the world with players attempting to visit coordinates called "dashpoints." Rather than using familiar locations, dashpoints are selected using rectangular grids laid over a map. A software program randomly places a dashpoint in each grid cell. To maintain consistency in locating dashpoints, the WGS-84 datum is used for determining positions. Unlike letterboxing and geocaching, geodashing uses no physical caches or clues for finding a location. Some dashpoints determined to be unreachable without crossing private property are marked as off-limits. Most

geodashing games involve teams of up to five players. To claim a dashpoint a team member must be on the Earth's surface within 100 meters of the dashpoint's coordinates. Successful dashpoints visited are logged to a web site. The first team to reach a dashpoint scores three points, the second team two, and all subsequent teams one point. To be considered a successful visit a team must provide a description of the site. Although not required, a photograph can also be taken showing enough of the site to verify that a team member has reached the dashpoint. The winning team is the one that collects the largest number of points within a predetermined time period.

Location Gaming and Teaching Geography

Location games provide a fun and challenging approach for teaching students basic land navigation methods. For example, in the process of locating or planting a letterbox or cache students use a compass or GPS receiver, become familiar with terminology used to describe terrain features, and gain confidence with navigation concepts and techniques. Such exercises also provide opportunities for students to learn from each other in a team environment.

Teachers can introduce letterboxing by having students locate an existing box. It is highly recommended that the teacher locate the letterbox in advance to be sure of its location. In the event that there is no letterbox nearby, the teacher can plant a box in close proximity of their school. As students become more familiar with locating boxes they can be encouraged to plant their own.

The basic components needed for creating a letterbox include a waterproof container, small notebook, rubber stamp, ink pad and zip-lock bag. Metal "ammo" boxes are often used as letterboxes but an inexpensive plastic "tupperware" container with a tight fitting lid also works well. On the outside of the letterbox students should attach an explanatory note sealed in a zip-lock bag for anyone who inadvertently finds the box:



<box's name> letterbox. Please do not remove from this location. Enjoy the contents and replace where found, hidden from view. To learn more about letterboxing visit www.letterboxer.co.uk or www.letterboxing.org. If contents are missing please contact <name/telephone number>.

An important part of letterboxing is the box's unique rubber stamp, used by finders to record a visit within their personal logbook. Students can purchase a pre-made stamp or create their own using a vinyl eraser or blank stamp block. The process of designing a custom stamp is relatively easy. An image such as the outline of a bird or other object representative of the box's name should be identified. The image can be transferred to the stamp block

using a soft lead pencil and tracing paper. The tracing paper is then placed with the lead against the rubber block and gently burnished. In this way the image is transferred to appear in reverse, especially important if words are to be used. The rubber block can be carved using an X-acto knife or Speedball nib (nib #1 for details and #2 or #5 for other areas). Each student can use the same method for carving his or her personal stamp. The logbook used to record the stamps of letterbox visitors can be created using sheets of paper cut into 2¾ inch strips 8½ inches long that are folded in half and stapled in the center.

Hiding a letterbox requires skill in using a compass and measuring distances from landmarks that will be recorded as clues (see example of a clue set, Figure 4).

The Sand Springs Letterbox, placed in Sand Springs, Tulsa County, Oklahoma by Donna on February 8, 2003 (posted on February 15, 2003) is now available again. Try not to let anyone see you retrieving it from its hiding place, or putting it back.

Towns need Water, children need a Home,
A nation needs Highways, to ramble and roam.

Find where the Katy crosses the Sand Springs.
Under the bridge are a couple of things.

One is a cache, with a log you may sign.
The other is me – trade your stamp with mine.

If you hunt by night, you'll need a light.
Crawdads sit tight, by day out of sight.

(Boo-hoo-hoo! You want a better clue?
Look east of nineteen twenty-two.)

More help: there is good parking at the drug warehouse.

Source: http://www.letterboxing.org/BoxView.asp?boxnum=144&boxname=Sand_Springs

Figure 4. Clues for a U.S. Letterbox

A baseplate swivel-type compass is the best type for letterboxing. An important issue in developing clues is whether to use magnetic north or true north. Whereas most maps are aligned with true north, the direction of the North Pole, the north arrow on magnetic compasses points in a direction slightly southward of the Pole for most places in the Northern Hemisphere. Therefore readings on magnet compasses must be adjusted east or west to compensate for this difference, called declination. Since letterbox clues are most often referenced to local landmarks it is often best to use magnetic bearings. Students should remember to indicate within the clue whether magnetic or true bearings have been used. An important issue for writing clues and finding letterboxes is determining distance that is recorded in the form of paces. Although each person's pace will differ slightly, most definitions describe the distance of a single pace as about 30 inches (0.76 meters). This is the distance traveled each time the right foot touches the ground while walking normally.

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The hiding place for a letterbox should be relatively obvious to someone who can interpret the clues. It may be helpful to state in detail how the box was hidden (such as under a rock cairn or inside a tree stump). Once the letterbox is hidden, students can share their clues with the class or enter them on a web site for others to find (see Figure 5). An important point is that distributing clues for a letterbox implies that the hider will maintain the box through periodic visits and notify others if it is removed or no longer maintained. A classroom activity is for students to share stories of how they unraveled clues to discover boxes.

Like letterboxing, geocaching can help students develop a better understanding of concepts such as scale, distance, and direction. Compass navigation is replaced by the use of GPS receivers for locating clues referenced to latitude and longitude coordinates. In recent years GPS receivers have become more affordable and several types can be purchased for less than U.S. \$100. Most receivers feature a small liquid-crystal screen that displays the user's location along with other places, known as waypoints, that are entered by the user. Some units also display landmarks such as highways, roads, water features, and contour lines. Teachers should introduce basic GPS skills by having students use receivers to navigate to a nearby point such as a light pole or bench. Geocaching may not work well in urban areas having tall buildings due to the difficulty of maintaining line-of-sight contact with satellites needed for a position fix. The materials used within a geocache are almost identical to what is found inside a letterbox except that the logbook is used to record names instead of stamps. Nearly all geocaching clues are distributed via the Web.

It is important to caution students to use care when hiding or attempting to locate letterboxes or geocaches. Students should be reminded to be respectful of property owners by asking permission before crossing private property or planting boxes or caches. Livestock gates should be left open or closed depending on how they were found.

Conclusion

There is something magical about exploration, discovery, and travel. Unlike tangible things that can be acquired, place collecting, peak bagging, and location gaming focus on an event; that is, reaching a place. At times the goal of adding another country to the list, checking off another summit, or collecting a unique stamp may become the driving motive. However, no matter what the reason, experiencing new places, whether a few miles from home or half a world away, helps enrich our understanding of and appreciation for our surroundings. Place collecting, peak bagging, and location gaming appeal to our sense of adventure, beckoning us to leave the beaten path. For teacher and students, location games provide a venue for teaching landscape interpretation as well as basic geographic concepts. 🌐

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Place Collecting

Travelers Century Club
Globetrotters Club
Hard Rock Café
Extra Milers Club

www.travelerscenturyclub.org/
www.globetrotters.co.uk
www.hardrock.com/locations/cafes/#personal
www.umich.edu/~jnorthup/emc/links.html

Highpointers Club
Degree Confluence Project
Tri-state Corners
Benchmark Hunting

www.highpointers.org/
www.confluence.org
www.bjbssoftware.com/corners
www.geocaching.com/mark/

Peak Bagging

List of 14ers
Four Thousand Footer Club
Catskill 3500 Club
Great Smoky Mnts 900 Miler Club
County Highpoint Association
America's Roof
Sierra Club peak awards

www.cmc.org/cmc/tnt/975/14erlist.html
www.amc4000footer.org/
www.catskill-3500-club.org/
members.aol.com/g900miler/
www.cohp.org/
www.americasroof.com/
angeles.sierraclub.org/hps/emblems.htm

Letterboxing

Dartmoor Letterboxing
Letterboxing North America

www.letterboxer.co.uk/
www.letterboxing.org

Geocaching and Geodashing

Geocaching
Geocaching Assoc. of Gr. Britain
Geodashing

www.geocaching.com/
www.gagb.org.uk/index.htm
www.seaotters.net/~scout/Geodashing/faq.htm

Figure 5. Websites for Place Collectors, Peak Baggers, Letterboxers and Geocachers



Forest-Student Interface in Geography Pedagogy

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Introduction

With the advent of new technology, many new and stimulating developments have been seen in recent years in the study of geography. The influx of new information made this discipline more difficult and complex for the new students. This shows that subjects require not only the new information but also the fresh concepts and frameworks in the subject.

Geographical knowledge provides us with a better understanding of spatial and temporal distribution of phenomena, processes, and features as well as the

interaction of humans and their environment.

The appropriate understanding about the Earth and environment is not only important for better land use planning, understanding about the relation between internal and external processes, but also to explain the local, regional, and global dimensions of natural phenomena in geography. Forests indicate many such phenomena, which are otherwise not visible to common eyes, therefore studying them and understanding the processes involved is very important to understand the natural environment as a whole.

GEOGRAPHICAL UNDERSTANDING ABOUT THE FOREST

In geography, forests come under the category of renewable resources. Of course, this does not imply unconditional renewal. Such resources are self-renewing at a limited rate, which may itself depend on the size of the stock in existence at any given time and on the extent and nature of human intervention into the stock dynamics. Regardless, renewable resources is an apt and useful term for forest (Allen V. Kneese 1988). As a renewable resource the forest plays many crucial roles in our life.

- Most importantly, forests are the source of many kind of woods, food like fruits, honey and spices, various types of canes, bamboos, and grasses, which are useful in making homes and other structures.
- Forests help in attracting rain clouds which means good rainfall. It has been proven that an area that loses its forests also loses an important agent of water.
- The thick cover of forests allows rain water to seep down slowly into the ground and remain there. This helps in building up a supply of fresh water. It also stops the force of the rains from washing away topsoil to the sea. This helps in protecting the soil against soil erosion.
- Forests are nature's own pharmacy filled with species that are of great value in

medicine and science. They are very precious because these plants and animals will not survive anywhere else.

- The insects, bats, and birds of the forest are important for pollination and seed dispersal. Without them re-growth of forests would not take place.
- Forests are home to tribal societies, culture, and technology including traditional knowledge of the forests. (Rao 1999)
- Forests also provide us hygienic services such as dust absorption and noise reduction etc.
- Forests do have aesthetic aspects like the psychological role of green color and diverse horizon.
- They also provide us the educational facilities for understanding the geological, botanical, zoological, and various other scientific issues of nature.

Many of these functions are hidden not only from the broad public but from geographers as well. It is very important to develop opportunities that will increase the awareness of the importance of and opportunities to understand forested areas.

Architecture of a Forest

A forest is defined as a plant formation consisting of trees growing close together and forming a layer of foliage that largely shades the ground. Forest often shows stratification with more than one layer. However, different types of forest show different architecture.

For example in a rainforest you can see the following layers:

The Giants: These are trees that tower above all other plants and are called emergent. They are found mostly few in numbers and have small leaves, umbrella shaped crowns, and tall slender trunks.

Green Carpet: The next layer is known as canopy. This is formed by flat crowned trees. This layer absorbs most of the sunlight. Only 2-5% filters down below.

The Understorey: This layer consists of young canopy trees, shrubs, and creepers. Many of the young trees have large leaves. These help in absorbing light in the dim understorey.

Forest Floor: The forest floor is very different from the canopy. The air is very still here. Humidity is always high. The temperature stays almost the same throughout the year. Vegetation is very sparse since there is almost no sunlight. Mushrooms, ferns, herbs, and seedlings are found here. The forest floor also has a layer of dead leaves, fallen logs and dung of animals. (Rao 1999)

Understanding the Planet History with the Help of Natural Vegetation

According to the Bradley Commission on History in Schools "...geography is by nature the constant companion of historical studies; it is

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hardly possible to grasp the one without the other." Therefore we must learn geography in order to learn history (Walter A. McDougall, 2003). Until now our history has recognized stone and metals as base materials for the development of material culture of man during various stages of evolution. As such, the pre-historic period of man has been divided into the Old Stone Age, New Stone Age, Iron Age, and Bronze Age. Wood has not been recognized as an epoch, making material a la stone and metal. Wood could have been significant in the life and culture of early man and also among many societies in the modern periods, as has been pointed out by later research. The archaeologist found generally stone artifacts and not the remains of wood implements as these could not have been preserved, because wood eating insects in forest areas devoured them, and in wet areas they were decomposed. Recent studies in ethnography reveal that there have been people using only wood as the base material for the development of their material culture. With the study of forests, students therefore can understand some unexplored dimensions of human history (Awaradi 1990).

There is no direct or documentary evidence to know the growth, pattern, and density of population of the world during the pre-historic period. Through the study of forests a student can get glimpses of prehistory as historians say that life appeared on Earth in the form of algae and primitive bacteria in Archean times (beginning 570 million years ago), and earliest land plants and insects are found fossilized in Silurian rocks datable to 438-408 million years ago. But these plants were extremely primitive; even ferns and mosses appeared only in the Devonian period (408-360 million years ago), and flowering plants only in the Lower Cretaceous epoch (beginning 144 million years ago). The earliest grasses came in Eocene, 55-38 million years ago. It is probable that by the beginning of Pleistocene, over 1.8 million years ago, the vegetation in the form of trees, bushes, shrubs, and grasses would have appeared familiar to us, though on closer scrutiny we would have found many species of plants that no longer exist today.

Within the two million years of Pleistocene, vegetation must have altered in character over much of the land mass as the ice ages and interglacial periods followed one upon the other. What vegetation there was, before man began to cut forests or clear land for cultivation and to set his cattle to graze over,

is often called natural vegetation. It is often supposed that one can establish what the original natural vegetation was by looking at the plant cover in the 'reserved' forests and wastelands today (Habib 2001).

LEARNING ABOUT THE WORKING OF AN ECOSYSTEM

Geography is the science of space and place on Earth's surface. Its subject matter is the physical and human phenomena and processes that make up the world's environments and places. According to David J. Rutherford it's important that geography should focus more on processes rather than features. Learning about processes helps to explain and understand the world we live in, but a focus on features tends toward simple descriptions of what exists and can easily devolve into lower order thinking and memorization of encyclopedic lists. In this context the study of ecosystems is a good example. The study of ecosystems does not merely focus on the distinctive regions that are defined by plant and animal communities, but also the interactions of these communities with the other three components of the physical environment, and that provides us an understanding about the different processes. It entails inquiry into connections and relationships among life forms, physical/environmental features and processes, ecosystems, and human societies (Rutherford 2005). The ecosystems vary in size, shape, and complexity and a geography teacher can appropriately illustrate this with an example of a forest.

In general terms, a system of organisms functioning together with their non-living environment became known as an ecosystem. There are four basic components of an ecosystem. First is the non-living environment, which is the abiotic part of an ecosystem. Second, the green plants work as producers or autotrophs in the system as they are capable of producing their own food by using the energy of sunlight to make carbohydrates from water and carbon dioxide. Third are the consumers or heterotrophs. These are animals which obtain their food by eating plants or other animals. And fourth are the decomposers, such as the bacteria and fungi that promote decay. In this way the green plants play a very important role in the trophic structure of an ecosystem as they are the only producers of food in an ecosystem (Bryant 1997).

A forest is a complex ecosystem with a large standing crop. Much of this is made up of the wood of the trees themselves, which is

nonproductive but represents energy stored in the system as biomass. Leaves, the productive part of the trees, form an extensive surface area for photosynthesis, so that a lot of food will be available from the primary level. The amounts of food produced and the paths the energy contained in the food take through the ecosystem will vary with such factors as the species of the dominant trees and the climate (Bryant 1997). It is estimated that two-thirds of the world's land area is still covered in forest, occupying many different climatic zones; not surprisingly, there are significant contrasts within the ecosystem type. Many naturalists have devised differing classifications of forests in relation to climatic zones, but there is general agreement in distinguishing boreal, temperate deciduous, and tropical rain forests. This indicates that the biosphere is divided into several natural ecosystems on the basis of life-forms of world vegetations (Bryant 1997).

WHY ARE THE FORESTS HERE, NOT THERE?

Forests are found in the different types of patches in the world. Geography teachers thus need to explain to their students that the forests are not distributed randomly on our planet Earth, but their specific positions on Earth is the result of a particular pattern of physical and man-made environment.

They can discuss with their students that naturalists have long posed these questions: Where did all the types of plants and animals come from; how long have they existed; and why are they distributed as they are? Until the nineteenth century the answer to these questions tended to be that all organisms had a divine creation and that species did not change, but in the 1850s two eminent naturalists, Charles Darwin and Arthur Wallace, made a revolutionary contribution to the study of life. They argued that all plants and animals had arisen from preexisting forms and that they had developed from them by a process of organic evolution. Darwin's and Wallace's ideas have been supplemented and modified by subsequent work, particularly in the field of genetics, so that now we are able to explain the origin and distribution of species more fully. The genetic material possessed by an individual is known as its genotype. This fixes the potential development of an individual, but the actual physical expression of this, the phenotype, may be modified by the environment. For example, a plant may carry genes to enable it to grow tall but if environmental conditions are adverse it may only achieve short growth. Therefore, the

apparent variation in a population is partly due to genetic material and partly due to environmental factors (Bryant 1997). In environmental factors, climate, that is, temperature, rainfall, sunlight, humidity, and wind, is the major determinant. Soil factors are by and large of secondary significance, though their role is quite vital in distribution of species. Topography, or physical features, like altitude, slope, etc., account for certain characteristics. On these features, forests of the world can be divided into the following three main types.



Forest of broad-leaved evergreen trees are found in lands on and near the equator, with hot and humid climate throughout the year.



Forests of deciduous trees, which shed their leaves for part of the year, are found in tropical climates with a dry season and in temperate lands where tree growth stops during the winter months. Forests of this type have been cleared mostly by human beings for agriculture and industry.



Coniferous or cone-bearing forests predominate in lands with a very long, cold winter and a short tree growing season. These are evergreen trees with small needle-like leaves.

But no hard and fast line exists between the various types of forests and there is no clear-cut distinction between forest and grassland; the boundaries of these forest types merge

Here is an example of teaching about the crop biodiversity in an Indian school, where students saved the farmers from the hazardous effects of drought. Adharshila is a small school for tribal children in western Madhya Pradesh, India-run by the Veer Khajiya Naik Manav Vikas Pratishthan. In this region, as in most parts of India, cash crops or hybrid seeds promoted by government or commercial agencies are replacing local crop varieties. With help from the Adharshila teachers, students interviewed village elders, and made lists of the crops sown on their farms, marking separately the local seeds and the hybrid seeds. Students also collected about 200 samples of 25 varieties of local seeds from 25 villages. A plot of land at the school was reserved for propagation of these seeds. Local tribal elders explained to the students that the seeds should be intercropped, as this reduces the risk to farmers. A drought occurred that year. A survey of the crop failure in the year showed that soybeans failed due to lack of water, but jowar, bajra, a local variety of maize, and other smaller grains survived. The wiser farmers were the ones who had planted several varieties of crops, including local varieties. At a parents' meeting the Adharshila teachers discussed the importance of biodiversity, and some parents agreed to propagate local seeds. The understanding of crop diversity, and the need to conserve it for livelihoods and other purposes, was being revived (Sarabhai, and Menon 2001).

into each other. Thus on the basis of local conditions of climate, soil and altitude, various sub-types of forests come into existence (Shobhita1998).

EDUCATION ABOUT BIODIVERSITY

The word biodiversity is often heard in connection with how it is fast disappearing. The call has been sounded frequently that if humanity is not careful we are going to lose the fibre of the planet that makes life possible (Taneja and Kothari 2001). Short for biological diversity, biodiversity includes all organisms, species, and populations; the genetic variation among these; and all their complex assemblages of communities and ecosystems. It also refers to the inter-relatedness of genes, species, and ecosystems and their interactions with the environment. Usually three levels of biodiversity are discussed – genetic, species, and ecosystem diversity (Ecological Society of America). Knowledge of biodiversity has increased in the last ten years, as has the realization that something must be done to counteract the loss of species, populations, and ecosystems. There is still much to be learned about biodiversity and its relationship to the functioning of our world, so scientific research continues. Global Initiative on Biodiversity Education, which UNESCO developed jointly with the Convention on Biological Diversity, has led to the agreed CBD Programme of Work on Biodiversity Education and Public Awareness (UNESCO, 2008).

In this context the study of forests can contribute significantly in the education of biodiversity. Forests contain the greatest assemblages of species found in any terrestrial ecosystem, and the status of biodiversity is, in itself, an indicator of forest

condition. Forests encompass biodiversity at the ecosystem level, the species level, and the genetic level.

The study of all these aspects of forests provides a basic understanding of physical geography. This gives us an introduction to the process and patterns of the physical environment and demonstrates a connection between human activities and the Earth system. It would also help in the development of different dimensions of scientific attitudes in geography students.

Human Geography: Economic and Social Aspects

Human geography is an integral and important part of the course structure in most of the geography departments of different countries. And the study of forests is not only important for the understanding of physical geography but it also promotes scholarship and creativity in the discovery, synthesis, and transfer of knowledge relating to the different dimensions of human geography. For example, forest-based industry is always included as an important chapter in our economic geography textbooks by the scholars and the study of forest-based societies provide us the knowledge of social, cultural, and human dimensions of geography.

Forest-Based Tribal Societies

One of the popular and widely accepted definitions of human geography is the “man and his adjustment to his natural environment.” There are numerous racial and ethnic groups in the world, and the geo-climatic conditions of the various parts of the Earth differ widely from each other sustainably. Each society or

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ethnic group uses, misuses, and under-uses its natural resource base according to its cultural stage and technological advancement. In this way human geography admirably serves the objectives of a liberal education. It helps us to understand the world we occupy and to appreciate the circumstances affecting peoples and nations other than own (Mazid, 1994).

Forests have long been home to indigenous peoples who have shaped civilizations and cultures based on the environment in which they live. Great civilizations like the Mayas, Incas, and Aztecs developed complex societies and made great contributions to science. Living from nature and lacking the technology to dominate their environment, native peoples have learned to watch their surroundings and understand the intricacies of the forest. Over generations these people have learned the importance of living within their environment and have come to rely on the countless renewable benefits that forests can provide. They have developed their own ethos and lifestyle (MONGABA.COM).

Only in this century have other humans appeared in great numbers in the forest, and they are destroying it at such a prodigious rate that if they continue within a few years only isolated pockets of forest will be left. The traditional forest dwellers are powerless to resist as their home is plundered for timber and mineral wealth, and razed to the ground to make way for huge development programs. Even they themselves are on the verge of extinction.

The study of forest-based society is not only helpful in understanding the relationship between man and environment but it also covers a very wide field. It embraces the study of human races; the growth, distribution, demographic attributes, migration pattern, settlements, and the types of economic activities. The pattern of their life indicates that variation in human behavior around the world can be explained by differences in the natural environment. The philosophies, approach, and practices which inform and flow from a concern with the environment are known as "*determinism*" in geography. The essence of the deterministic school of thought is that the life of a human being is governed by physical factors or environment.

But the developmental activities and deforestation by outside populations gives an altogether different picture. This shows that man is not a passive agent but he himself brings his influence on environment. This approach is supported by possibilists and termed as

"*possibilism*". The essence of the possibilist approach to the problem of the relationship between man and his environment can be summed up as follows: 'Nature does not drive man along a particular road, but it offers a number of opportunities from among which man is free to select' (Mazid, 1994).

The man must decide if he joins with the hands of indigenous people and '**stops**' cutting the forest, or he would '**go**' along with modern civilization and continue destroying the forest and in consequence will lose the life supporting system in the future. This is the essence of neo-determinism, or stop and go determinism philosophy, which was put forward by the Australian geographer Griffith Taylor.

FOREST-BASED INDUSTRIES

Economic geography is an important branch of human geography. It mainly deals with the distribution of natural resources and their use by Man. Courses in economic geography may cover such topics as transportation, agriculture, industrial location, world trade, and the spatial organization and function of business activity.

According to a Food and Agriculture Organization report some 1-2 percent of total economic activity in most countries is contributed by the forest and forest industries sector, while in countries with a heavy dependence on wood in production or energy supply this figure may rise to 5 percent or higher (FAO 1985). The world has a rich diversity of forest resources which are capable of supporting a wide variety of industries. Timber is the most important forest-based industry. The paper industry is also a vital and core industry for any country. Other forest-based industries are rubber, match, cane, lac, resin, and medicinal drugs industries.

Location of industries is known as an important theme in Economic Geography. Geography is not only concerned with existing locations but it also tries to identify an order or system in the distribution. The distribution of industries is not, in fact, totally random but it is arranged in an ordered pattern. Economic geographers tried to develop a theoretical framework on the basis of this ordered pattern. A central theme in the development of industrial location theories has been the concept of optimum or best location. Since location theory has been largely developed in capitalist societies, the best location is taken to be that which gives the best profits. The best location is therefore where costs are lowest and revenues are highest, since income minus expenditure equals profit. In this context, two principal approaches to location have been developed

so far. In the first, or least cost theories like Weber's, revenues are taken as being equal at all locations, and variations in costs from place to place are examined to find the location where costs are least. In the second or maximum revenue theories like Losch's, costs are taken as being equal at all locations, and variations in demand are examined to find the location giving the maximum revenue (Knowles and Wareing 1996). Like any other industry, forest related industries are also not located randomly. Therefore by using the spatial pattern of forest-based industries as an example, a geography teacher can clearly explain the location theories like Weber's and Losch's to his/her students.

The student can also understand the world trade pattern with the help of the study of the forest sector. Trade is a major component in the activity of the forest sector, and forest products are important in international trade, constituting 2.5 percent of world trade, 20 percent of the total agricultural products trade, and 10 percent of the agricultural exports of developing countries. With the growth in demand for forest products, it is to be expected that the volume of trade will expand further (FAO 1985).



Certainly, forestry is a very profitable business, but in limited extent. Forests grow back in time. But if we take from them faster than they can grow, we lose forests. There are examples from Malaysia and Indonesia of the dangers of over-logging. Vast areas of forest are now bare (Rao 1999).

Therefore a major effort of investment in infrastructure, education, and training will be involved in building up the level of forest industry required to meet the needs of different countries without harming the interests of future generations.

PROBLEM OF DEFORESTATION

Deforestation, as the term implies, is the removal of forests – their complete clearance by cutting or burning. For a long time, human beings have cut down trees and cleared forests for fuel and to make space for

There is a folk song by Ghanshyam Shilani (Chipko Poet) which starkly portrays the conditions of the forests: "Brothers and Sisters! Wake up, forest has been clean-shaved by the Government and the contractors, hug the trees, don't allow them to be cut, don't allow the wealth of the hills to be plundered".

About 'Chipko': *The forests of India are a unique resource for the survival of the rural people of India, which were exploited greatly for commerce and industry. The Chipko Movement of India, taken birth in the Himalayan foothills, gained great significance throughout the world's environmentalist circles for its successful efforts against deforestation. Chipko, which means literally "to embrace", has spread to many other parts of India and has drawn worldwide attention for its resourceful efforts to fight against deforestation and thereby protecting ecology and society. Women played a unique role in the success of the Chipko Movement because they, being dependent on the fuel, wood, and fodder for survival, found it difficult to procure them for over the last several decades (Meduri 2004).*

agriculture, settlement, and industry. But the effect was not as disastrous as what deforestation now signifies; the process was slow and allowed time for regeneration, so it did not have an adverse impact on the environment. With the increase in population, the clearing of forests has been speeded up with disastrous effect.

Carrying Capacity: *Here a geography teacher can discuss the concept of carrying capacity and sustainability with his/her students.* Our planet is capable of supporting only a certain number of people. The more people there are, the more pressure there is to clear forests to make settlements. The less forest space there is the more crowded the animals become. Many may just die.

For the people, too, life becomes hard. Fresh water and other resources have to be shared by so many that each person gets very little. To meet peoples' demands, economic growth and development also take place. This sometimes damages the environment (Rao 1999). Therefore, sustainable development became a popular concept, finding acceptance after the 1992 United Nations conference on the Human Environment in Stockholm. The concept had been around for a decade or so (Shobhita 1998). The term was coined by the Brundtland Commission and is defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."

Causes of Deforestation: A geography teacher must discuss the following causes of deforestation so that students should develop some concern about the deforestation problem. Actually this concern should not be about the losing of few plants and animals; they should understand that mankind stands to lose much more. By destroying the forests, we risk our own quality of life, gamble with

the stability of climate and local weather, threaten the existence of other species, and undermine the valuable services provided by biological diversity.

Population increase: The massive population increase has put tremendous pressure on land all over the world, especially in the developing countries.

Extension of agriculture: As a direct result of the increase in population, agricultural lands have been extending day by day leading to the cutting down of forests.

Growth of industries: Furniture, paper, and pulp industries require huge amounts of timber every year. This has led to deforestation on an alarming level.

Corrupt practices: The problem of a corrupt nexus between forest officials and poachers/mafia has degraded the general environment of forests and led to deforestation.

Spread of tourism: The growing pressure of tourism has caused an effective loss of forests to allow for construction.

Forest fire: Forest fires, whether due to anthropogenic or natural factors, have caused loss of forest resources in different parts of the world for thousands of years.



TEACHING METHODS

The problem of teaching about forests lies in the question of how to explain the importance and significance of forests to geography students while in class.

Class Teaching is understood as a simple educational form consisting of traditional teaching methods such as lecture, discussion, pictures, charts and film display, project preparation, problem solving, etc. The focus of this kind of education is based on indoor activities. No doubt these activities are important but they do not provide the real picture of subject.

If the objective is to encourage active student participation, it is important to apply attractive educational methods in a series of stages of forest study like field trips and the use of GIS technology. GIS technology represents a very effective teaching tool. If a geography teacher links the forest fieldwork with GIS, it can open new horizons to the geography teaching.

Field Trips are a very important teaching method, especially for geography. In this context the National Focus Group on Aims of Education, India, discusses that it may be useful to consider some of the implications of what has been said so far for pedagogy and evaluation. The strangeness of the school environment can be mitigated by imaginatively linking the experience of school with the child's experience outside it. Pedagogy will gain, but will also incorporate the children's experience of what the Greeks used to call *oikos* (house, or ecology), and likewise it can teach them fresh ways of experiencing the world outside the school. For example, if a child has grown up in intimate contact with the nature around him, as most children in tribal communities do, school can enrich and enhance this intimacy by sharpening the child's awareness of his own natural environment – something that sadly does not happen in most of our schools and colleges (National Focus Group on Aims of Education, India 2007)

Therefore, a geography teacher must organize an outdoor trip to:

- a) Natural Forest Areas;
- b) Wildlife Sanctuaries and National Parks;
- c) Forest Museum;
- d) Saw Mill or Logging Site;
- e) A nearby Zoo.

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Encourage students to plant some trees

Trees are our most precious asset. It takes about a 625-square-foot area of vegetation to produce the oxygen requirements of one person. There are countless benefits we get from having trees around us (Rao 1999).

So, students must know how to plant trees. And a geography teacher can help them in setting up a nursery in their schools or college. They can collect the seed from nurseries, local forest departments or from nearby forests.



A tree that lives for 50 years generates Rs. 5.3 lakhs worth of oxygen, Rs. 6.4 lakhs worth of recycling nutrients, and control of soil erosion, creates Rs. 10.5 lakhs worth of air pollution control, and Rs. 5.3 lakhs worth of shelter for birds, insects, and other animals. Besides, it provides flowers, fruits, fodder, and medicines, to name a few. So even when one tree is felled we lose something worth more than Rs. 32 lakhs! (Rao, S., 1999)

Editor's reminder: The counting system of India recognizes a lakh as being a unit equal to one hundred thousand

Scope for Future Activities

At the end of class a student should understand that once a certain habitat or plant or animal dies out, nothing can ever replace it. It is lost forever. Therefore we must work towards preventing this. Thoughtless development and the greed for money lead to untold destruction of our surroundings. We must realize our fundamental duty to protect the environment whether we are adults or children. 🌍

*"Thou the first word of creation,
O, light cast thine auspicious eyes on the new plant,
Leave the message in its inmost heart,
That it will fulfill itself in many flowers,
And gathering vitality free thee, let its cool leaves
Lisp hymns to thee throughout hundred years"*

(Ravindar Nath Tagore, Nobel laureate)

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Dr. Kavita Arora, a lecturer in the Department of Geography, SBS College, University of Delhi, is particularly interested in the study of forestry and other environment-related issues in South and Southeast Asia. Dr. Arora has received her Ph.D. from the Political Geography Division of Jawaharlal Nehru University, New Delhi, India. She completed her post-doctoral research in 2007 from the Indian Council of Social Science Research, New Delhi, India. She worked on "Identification of Indigenous Methods for Tropical Forest Management: A Case Study of Andaman and Nicobar Islands" for her post-doctoral research. Since earning her Ph.D., Dr. Arora has been active in both research and teaching.



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The National Geographic Bee is a school competition for students in any grades four through eight. Excite your students about the world around them and reward those who excel in their knowledge of geography by giving them a chance to compete in a school geographic bee.

The final deadline for registration has been extended to December 11, 2009. After October 15, the registration fee increases to \$90. School level Bees can be held up to January 15, 2010. Go to www.nationalgeographic.com/geographicbee to get complete information and other dates and deadlines.

Principals must register their schools to receive the contest materials necessary to conduct a school level Bee. All we need is a letter on school letterhead, signed by the principal, with the \$70 registration fee (\$90 after

October 15) (check or purchase order made out to National Geographic). The registration is not refundable, so make sure the school registers only once. If paying by purchase order, note that when the school sends payment on the PO it must be clear that the check is payment on a PO that was sent earlier so that the school will not be entered twice in the system.

Mail the registration letter and fee, in the same envelope, to National Geographic Bee, National Geographic Society, 1145 17th Street, NW, Washington, DC 20036-4688.

We look forward to many more schools giving their students the opportunity to excel and also be encouraged to know more about the world in which we live and share, by participating in the National Geographic Bee.



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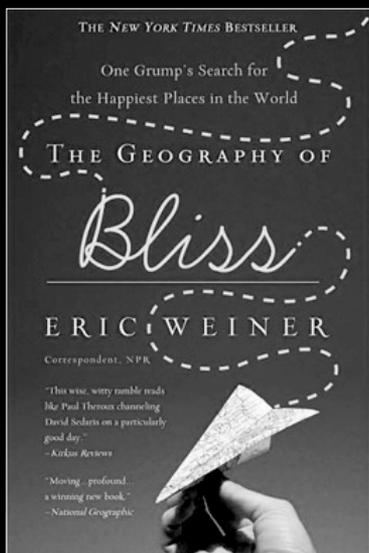
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Book Reviews

The Geography of Bliss

One Grump's Search for
the Happiest Places on Earth

by Eric Weiner



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Reviewed by
Kathryn Jones Verna

One part travelogue, one part objective investigative reporting on the nature of happiness (and in at least one unfortunate country, misery), and one part soul searching on the subject of his own self-described unhappiness, Eric Weiner's *The Geography of Bliss* defies easy categorization. The starting premise is straightforward – Weiner will visit Ruut Veenhoven, the founder of the World Database of Happiness (WDH) and arguably the world's foremost expert on happiness, learn which countries in the world are the happiest, visit them, and perhaps in the process resolve some issues of his own. Had the result followed this neat formula, it wouldn't be half as engaging as this charming read.

As a journalist and seasoned world traveler, Weiner admittedly has a few preconceived notions (the Swiss are infuriatingly competent!) about what his research will reveal. However, he seems willing, if not anxious, to challenge those notions. Liberally seasoned with quotes and anecdotes from the people he meets along the way, he also turns the lens on himself just enough to make us care about his personal quest. Although he describes himself as chronically unhappy – Weiner scores himself a six on the World Database of Happiness scale (“...considerably less happy than my fellow Americans, but according to the World Database of Happiness I'd feel right at home in Croatia...”) – his is the endearing, self-deprecating sort of unhappiness

that is easy to be around. He tells us he is unhappy, but it is hard to believe that real gloom could be so curious and open-minded.

Armed with data from the WDH, Weiner takes the short journey to Switzerland, a statistically “happy” place, a fact which is at first puzzling to his first interview subject. Barely off the train platform, Weiner is forced to re-examine what “happiness” even *is*. Swiss happiness is not characterized by a sort of lighthearted *joie de vivre*, but by social/metaphysical currents that run deep in the national psyche. Appropriate in a country so universally identified with banking; the author assigns it an equation:

$$\text{Happiness} = \text{Cleanliness} - \text{Envy} + \text{Nature}$$

By the time he boards his final Swiss train (for which he has declared his love at first sight) in Saint-Ursanne, he has examined the variables in this equation carefully, learning the Swiss social imperative “If you've got it, DO NOT under any circumstances flaunt it,” climbing the Alps, and wandering a village so excessively quaint that he finds an isolated case of graffiti a refreshing sign of life. While the result may not be the sort of transcendental bliss most Americans associate with the word happiness, a strong case is made for the “something more than contentment, but less than joy” that is uniquely Swiss.

Through eight more chapters, Weiner explores a fascinating range of cultural possibilities, finding more often than not that the conditions we normally associate with storybook happiness are neither prerequisite for, nor assurance of, real and abiding emotional well-being. The most striking examples of this are found in Qatar, where astonishing wealth does not lead to anything remotely like astonishing happiness, and in Iceland, where a breathtakingly harsh climate does not stand in the way of considerable love of life on the part of its citizenry.

Fortunately, explanation of Qatari discontent does not require any value judgment on the perils of excessive wealth, but rather rests on fairly objective traits. The first is that Qatar, as a nation, didn't exist until the latter half of the last century and is therefore devoid of anything resembling national culture – no national cuisine, literature, or arts. Virtually everything is imported to the small kingdom on the eastern coast of the Arabian Peninsula, whose only, albeit considerable, natural resource is a subterranean ocean of crude oil. Weiner's experience on Qatar Airways proves to be a preamble for his whole visit.

“Qatar Airways – an airline where no frill is too frivolous, no expense too expensive. Or silly.

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When we land in Doha, I am ferried from plane to terminal, a distance of about a hundred yards, in a BMW sedan that smells brand-new. I barely have time to get into the leather seat and caress the wood trim when it's time to get out again. Why bother? Ahh, I was asking the wrong question. In Qatar, nobody asks why. Why? Because you can. That's why."

Weiner is granted an interview with a small group of Qatari men, members of what is essentially one large extended family that makes up the native population (and possesses nearly all the wealth), and finds they are not happy. Or rather, that his question about whether they are happy seems confusing and possibly irrelevant to them. After some hesitation, it is explained that happiness is in the hands of Allah alone and so there is no point in striving after it. Passages like these provide the meat for what could have been an amusing, but forgettable read. Instead, Weiner uses these comments as a springboard to discuss research on the relative happiness of believers vs. non-believers of any faith, citing Aristotle in the process. Like any good preacher, Weiner pulls us in with an amusing anecdote, but makes sure we don't leave without a meaningful lesson. He concludes that this sterile, "airport lounge of a nation" is likely not very happy, because "humans, even nomadic ones, need a sense of home." The lesson is that even obscene material wealth cannot buy the two essential qualities of a home – a sense of community, and a history.

"I arrive to blowing snow and an inky black sky as dark and vast as outer space. It is 10:00 a.m." Thus opens the chapter on a happy surprise – Iceland, the most extreme example of a trend identified by the WDH; that all things considered, colder is happier. Weiner calls his favorite notion of why this is so the Get-Along-or-Die Theory.

In warm places, this theory states, life is too easy; your next meal simply falls from a coconut tree. Cooperation with others is optional. In colder places, though, cooperation is mandatory. Everyone must work together to ensure a good harvest or a hearty haul of cod. Or everyone dies. Together.

Iceland possesses what Qatar lacks – tremendous national culture and community. A favorite local joke is that "one day they will erect a statue in the center of Reykjavik to honor the one Icelander who never wrote a poem. They're still waiting for that person to be born." Iceland also supports the idea that smaller (the entire population of 300,000 is half that of Providence, RI) is better, at least when it comes to happiness. Parents need not warn their children to avoid strangers, because there are few strangers. The strong sense of community is expressed in governmental priorities as well. A relatively high rate of inflation is accepted in order to maintain extremely low unemployment of 1 or 2 percent. This is because inflation is "shared pain" while unemployment is "selective pain." In a country where

everyone knows everyone, selective pain is not so easily tolerated. While Iceland may not be for everyone, it clearly suits the hearty souls that call it home.

One of my favorite chapters to read, and possibly Weiner's favorite to write, given its relative length, is the account of Bhutan. In fact, the whole book may have been a pretext to satisfy a longstanding desire to visit this small Himalayan nation with the unlikely governmental policy of "Gross National Happiness." Weiner had learned about Bhutan while on a posting in India for National Public Radio in the early 1990s, but was never given a chance to visit. Bhutan held the promise of being a real-life incarnation of the Shangri-La of James Hilton's *Lost Horizon*. The chapter is filled with practical details about visiting (every tourist is assigned, and must pay for, a personal guide, and spend a per diem minimum while in the country. Thimphu is the only capital city in the world without a traffic light... and so on) as well as keen insights about the Bhutanese brand of happiness. On being greeted by his guide, Tashi, at the airport, "It's not like any handshake I've ever experienced. Two hands cupped over mine, head lowered in a half bow. It is a very deliberate, present action. At first, I find it off-putting. I'm just shaking hands with you, Tashi, we're not going steady or anything. Later though, I would learn to appreciate the Bhutanese handshake and come to think of it, the way they do nearly everything – cross the street, wash dishes – so deliberately, so attentively."

Here Weiner contrasts the Bhutanese way with the common American inclination to rush through the mundane tasks of the day and makes the argument that love and attention are really the same thing (any child will tell you this is true!) The conclusion is that "attentive people, in other words, are happy people."

I began *The Geography of Bliss* as a skeptic. Having lived on both coasts of the United States and in several places in between, one of my core beliefs is that we tote our state of mind around with us and shouldn't expect to "find it" at the next destination or fret about "losing it" when circumstances require a move hundreds or thousands of miles away from where they have been happy. However I became a believer that places might be divided into "haves and have-nots" during Weiner's account of a few depressing weeks in Moldova (an unhappy nation left sadly clutching the short stick since the fall of the Soviet Union). In discussing the ingredients of national unhappiness (jealousy, distrust, envy), he reconciled our divergent points of view. We can

take our happiness with us wherever we go in America because, for the most part, we live in a country of transparent democracy where corruption, while present, is frowned upon, if not always prosecuted. There are disparities between rich and poor, and social injustice remains, but generally speaking, there is understanding that the possibility exists to improve our circumstances. By contrast, in Moldova, there is a pervasive resignation to a collectively miserable status quo. It is a relief to say goodbye.

As I read *The Geography of Bliss*, I couldn't help thinking how much has changed in the short time since this book was researched. Iceland has suffered an economic meltdown and most of the globe is in a greater or lesser state of recession. Fortunately, the universal truths about happiness that are unearthed in *The Geography of Bliss* hold up well – the Icelanders will simply reinvent themselves, go on creating, and stay happy. The Bhutanese will continue to cooperate in order to pass each other on the nation's only highway. And as for the Moldovans, it is interesting to note that in April 2009 (a year or so after the original publication of *The Geography of Bliss*) crowds took to the streets in the capital of Chisinau to protest the election of a Communist Party member as Prime Minister. Perhaps this unassuming book jolted just enough of them from their resigned misery to change the course of the history.

If your own scarce resources prevent world travel this year, enjoy a trip with Eric Weiner. He may or may not have found the key to his own happiness, but in the process of trying he has provided an amusing, thought-provoking, and sometimes touching commentary on one of the most basic of human emotions. 🌐

Kathryn Jones Verna was born on the West Coast, raised on the East, spent ten years in the Arizona



sunshine, and now calls the Great Lakes region home. Her mother taught her to love books, but she nonetheless acquired degrees in Engineering and Business, where the bullet point and TLA (three letter acronym) are what usually suffices for prose. Along with her two children and three stepchildren, she is hoping someday to figure out what she wants to be when she grows up, which should come as a relief to her loving husband, Vince.

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Say You're One of Them

by Uwem Akpan



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hardcover
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Reviewed by
Trill Dreistadt

Uwem Akpan's collection of short stories *Say You're One of Them* offers a mind-numbing immersion into the stark reality of survival in many countries of Africa where the overwhelming social issues of poverty, disease, lack of education, and genocide force families to compromise their children, their Christian values, their souls just to survive to the next day. In the midst of dire circumstances that force inhuman choices, the light of hope, the possibility of escape, the innocence of children are ineluctably extinguished. The resulting wretchedness eclipses human passion and dignity. Deceit reigns supreme and children are exploited and violated ruthlessly. It's a tough read, but a requisite one for those seeking a more humane compassion for the tragic struggles facing so many in Africa today.

In "My Parents' Bedroom," a disturbingly raw indictment of ethnic hate in Rwanda, two small children are sucked into its violent vortex. Maman (a Tutsi) and Papa (a Hutu), the parents of nine-year old Monique and her toddler brother Jean, have hidden Tutsi refugees in the ceiling of their home from their Hutu tormentors. Knowing that the truculent mob of Hutus will soon descend on their home to ravage those hidden within, Maman cautions her children to silence, darkness, and this warning as she ascends into the ceiling to comfort those hidden there: "When they ask you, say you're one of them, OK?" The only way to spare her children if they are discovered is to claim their father's ethnicity.

At this moment, Monique's uncle and great-uncle and the angry mob break into the house demanding to know where her parents are. One of the men sexually violates little Monique while her uncle ignores her cries for help, so obsessed with his own hate that he is immobilized to even save his own blood.

It is in her parents' bedroom where young Monique witnesses both the absolute beauty of her mother and her savage death at the hands of her father, forever losing any innocence she may have had. "My mother is a very beautiful Tutsi woman... high cheekbones... sweet mouth... lips a deep red..." When the savage mob discovers that she has given asylum to their hated enemies, they force Papa to kill her; she dies violently as his machete splits her head and "blood overflows her eyelids and Maman is weeping red tears." The mob sets fire to the house and incinerates all those within. There is no hope; there is no escape; there is no mercy for children.

In "Fattening for Gabon," Akpan's motifs play out again, this time in Nigeria where an uncle deviates from his usual trade of smuggling people across the border between Benin and Nigeria to selling his own niece and nephew into slavery. Ten-year old Nanfang, the persona, and his five-year old sister Yewa leave home with their parents' blessings because Fofu (uncle) Kpee has promised to deliver them to a better home with the opportunity for an education. The kids' parents suffer with AIDS, making them easy prey as they admit their own inadequacies for providing for their children. Believing Fofu Kpee, the parents instruct their children to be obedient and grateful and not shame the family name. Kpee's deceit is excruciating and once again, the theme of exploited children stuns us as the unscrupulous Fofu literally fattens up his own brother's kids for the slavery market in Gabon, an enterprise undertaken by his lust for money.

Before their journey, Fofu takes the children to church, reminding them of their Christian duty of obedience; the children are blessed and cursed simultaneously. These kids don't have a prayer. Even though they escape from the prison where they have been held prior to arrival in Gabon, they flee into a world where there is no hope or protection or reprieve for children.

In "An Ex-mas Feast" Akpan's themes emerge in a family life where twelve-year old Maisha whores at night to bring in money for school tuition for her eight-year old brother Jijana, the oldest son and hope for the family. Though her mother and father, Baba, deride her with shouts of *malaya* (whore), they wholeheartedly endorse her whoring and encourage her street acumen to provide money for the season's annual feast and small gifts. If she can't bring home enough money, her mother has the glue bottle ready; sniffing it relieves hunger. As Maisha leaves for a night of whoring, we see her mother reading her Bible and her Baba working his rosary, a pathetic picture of heart-breaking poverty that has left this family destitute with few resources and little hope. Maisha's unfathomable dream of attending school herself dies daily as she hits the streets looking for clients.

Ten-year old Naema is being carefully groomed to continue in her sister's footsteps as she is taught the

fine art of high heels, make-up, and condom use. The other children take turns with three-month old Baby on the busy streets of Nairobi begging with him as bait, especially soliciting the *musumgu*, the whites.

At the end, Maisha's escape from the present misery of childhood prostitution only perpetuates the cycle as little ten-year old Naema takes her place.

I would highly recommend this collection for high school teachers and their mature students as a text that will foster compassion, stimulate discussion, illuminate the human condition in Africa, evoke emotions. The great Nigerian novelist Chinua Achebe offers this mandate through his character Okonkwo in *Things Fall Apart*: "We must root out this evil. And if our brothers take the side of evil we must root them out too." 🌐



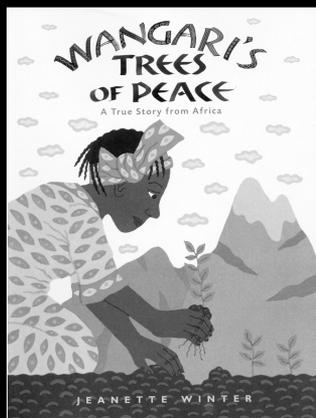
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Wangari's Trees of Peace

A True Story from Africa

by Jeanette Winter



September 2008
32 pages
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published by
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Reviewed by
Jan Smith

Wangari's Trees of Peace is an engaging and captivating book on many levels. Initially, as we read this non-fiction account with our children, it tells the life story of our hero, Wangari Maathai. (See review of *Unbowed*.) However, as we read more deeply and discuss this book with the young people in our lives, major geographic themes emerge and universal messages of humanity engage us. This inspiring book should be on the bookshelves in every home and school.

Richly colored illustrations fill the pages of *Wangari's Trees of Peace*. The beautiful pictures contain subtle nuances that observant children will explore such as the birds in the trees and the changes in the landscape between Wangari's childhood and when she returns from study in the United States. The compelling visuals

encourage the reader to contemplate the influence of colonialism and development in Kenya as well as consider how these changes influenced people's daily lives.

Upon a closer read, several major themes of geography are introduced throughout the book among them – a sense of place, human-environment interaction, sustainability, and diffusion. These themes are supported textually and visually. For example, in the book's introduction, we read "Wangari lives under an umbrella of green trees in the shadow of Mount Kenya in Africa," and we see a young girl surrounded with vibrant trees, animals, small homes, and the mountain in the background. This portrait allows us to quickly frame the place of this story and compare it to our own childhood place. As the story continues, we witness the transformation of the Kenyan landscape, the demand for firewood, and the increasing barren land. Wangari's idea, to plant seedlings, activates women, and the movement diffuses across Kenya. "Word travels, like wind rustling through leaves, about the green returning to Wangari's village." Diffusion is a fundamental concept in geography and one which, I think, is often neglected in elementary education.

Additionally, the book probes issues related to gender. A significant aspect of Wangari Maathai's innovative approach to planting seedlings involves engaging women in her environmental campaign. For every seedling planted that lives three months, the women earn a small wage. One frame in the book depicts several men laughing as women plant seedlings. The text reads "The government men laugh. 'Women can't do this,' they say. 'It takes trained foresters to plant tree.' The women ignore the laughter and keep planting."

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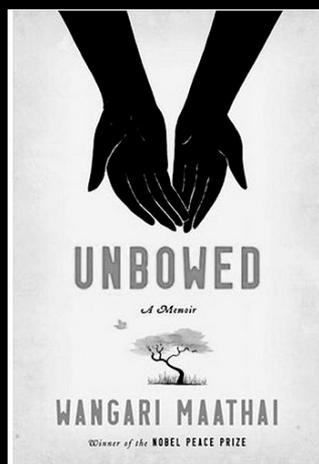
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This passage also exemplifies one of many universal messages that *Wangari's Trees of Peace* conveys. These messages of hope, persistence, and the importance of individuals are critical lessons for young children to think about. One major message involves the idea that people need to do what is right even in the face of adversity. Wangari's life was not free from challenge and controversy. At one point, she was imprisoned for standing up to the Moi government in Kenya. This chapter in her life is depicted and highlighted with the message that "Right is right, even if you're alone." Certainly, this is a universal theme for children everywhere to consider.

As a teacher who works frequently with elementary students, *Wangari's Trees of Peace* prompts many terrific classroom extensions. With older elementary students, teachers could use the book to launch research projects into African environmental

sustainability, the Green Belt Movement or how Nobel Peace Prize winners are chosen (Maathai was awarded the Nobel Peace Prize in 2004). In other disciplines the book could stimulate: science experiments with seedlings; assignments in language arts developing paragraphs about the student's own sense of place; or mathematics problems involving variables such as the numbers of trees planted, years to maturation, or area covered.

I believe the more we can engage children in extraordinary stories such as this one of Wangari Maathai and her influence in Kenya, Africa, and the world, the more we plant seeds for global concern for the environment and personal commitment to sustainability. Children are engaged by non-fiction stories which captivate their imagination, enrich their understanding of the world, and have strong heroic characters. *Wangari's Trees of Peace* certainly speaks to children on all these levels. 🌍



Unbowed

A Memoir
by Wangari Maathai

October 2006
352 pages
hardcover
published by Knopf
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Reviewed by Jan Smith

In her memoir, *Unbowed*, Wangari Maathai transports her readers on an exceptional journey from her birth in Kenya in 1940 through the many challenges she faced – as a woman, as an environmentalist, and as an activist fighting for justice – to her selection as the 2004 recipient of the Nobel Peace Prize. Maathai's eloquently crafted biography is rich in geography, history, and politics as well as personal struggle and triumph. Her life's journey allows us to witness the incredible transformation of the Kenyan physical and political landscapes due to colonial and post-colonial regimes as well as connect, on a personal level, to the obstacles facing east Africa in the 20th and 21st centuries. It is, however, the overwhelming feeling of hope which permeates even the darkest chapters of the book which allows us to feel both the tangible and

the spiritual effects of Maathai's work in Kenya and makes this book an important addition to my bookshelf.

Wangari Maathai's honest and passionate writing style engaged me from her initial description of the Kenya of her childhood. Throughout the book, she develops a strong sense of place which enables us to experience the fragrance of the jacaranda trees in bloom and visualize Kenya as a land of plenty. We also witness the transformation of Maathai's Kikuyu culture and suffer the multiple costs of the colonial period. One such example documents British replacement of native trees with exotic species which, eventually, destroy the natural ecosystem. Another tragedy involves the imposition of a cash crop economy which contributes to the decline of both cultural traditions and the environment.

Maathai reflects, with honesty, on her battle against political corruption, her interactions with the repressive Moi government and the devastation of her highly public divorce. She notes that these difficulties were due, in part, to her being an educated, articulate, and powerful woman. She faced discrimination based on her ethnicity as a Kikuyu, based on her divorced status, but perhaps mostly because she was an educated African woman. At the time, most women in Kenya who became prominent did so because of the importance of their husbands. Once, when Maathai was a candidate to chair the National Council of the Women of Kenya (NCWK), she realized that the opposition to her was not due to her ability to fulfill the duties of office, rather it was politics surrounding her level of education, ethnic background, and

marital status. As she notes, "Our refusal to acknowledge and reward ability and performance are among the reasons that Kenya finds itself in a state of underdevelopment". (p. 157)

Wangari Maathai's life story is one which inspires and calls us to action. Her life is a perfect example of how one person – with perseverance and commitment to social, political, and environmental justice – can make a difference. Once, at a meeting focusing on innovative approaches to agriculture, Wangari arranged seedlings as a map of Kenya specifically highlighting the most deforested areas to illustrate her idea of how to use seedlings to regenerate the land. Her ability to initiate and lead the Green Belt Movement and empower women to restore part of the environmental imbalance in Kenya is a spectacular story, a story which resonates with many today. The Green Belt Movement is really an environmental movement of the poor, but it spread to address other social and political issues as well. The Green Belt Movement works to foster personal responsibility for improving the quality of life in the local communities. Although it does not seem radical to us today, the holding of civic and environmental seminars to discuss the factors contributing to social problems in Kenya in the 1970s and 1980s were planting seeds of political change. Sustainability was reaching beyond the environment to the entire cultural identity of the people. As Maathai writes, "Many aspects of the cultures our ancestors practiced had protected Kenya's environment. Before the Europeans arrived, the peoples of Kenya did not look at trees and see timber or at elephants and see commercial ivory stock... we encountered Europeans... we converted our values into a cash economy like theirs. Everything was now perceived as having a monetary value. As we were to learn, if you can sell it, you can forget about protecting it". (p. 175) This realization brought about a significant change in the seminars they were conducting. Maathai maintained that culture was the missing element in the development of Africa.

Unbowed provides a detailed and personal account of Kenya over the last century. The book allows the reader to fully feel the imprint of the colonial period on both the environment, and, perhaps even more dramatically, on the cultural landscape. Reading this memoir has enriched my personal understanding of colonialism and the complexity of development in Africa. Additionally, the examples throughout the book allow me to provide more depth to my teaching. However, more significantly, Wangari Maathai's story exemplifies the power of an individual. The Green Belt Movement now involves several hundred thousand women (and many men), has more than 6000 nurseries, and has planted more than 30 million trees in Kenya. The movement has diffused beyond Kenya through central and southern Africa. One educated, articulate, and stubborn woman was able to accomplish more than she could dream – certainly a powerful counter-story to the despair and lack of hope often used to depict this region. Beyond enriching your personal intellectual library, *Unbowed* will, without doubt, provide rich examples for you to use in your teaching about Africa. 🌍



Jan Smith has been active in geography education at all levels during her 25 years as a teacher – middle school, high school, and now teaching World Geography, Cartography, GIS, and student teacher supervision at Shippensburg University in central Pennsylvania.

She currently serves as the Coordinator of the Pennsylvania Alliance for Geographic Education and has been Vice President for Curriculum and Instruction, and President of the National Council for Geographic Education. Mostly, she enjoys working in classrooms with students and teachers exploring maps, GIS applications, and geographic questions. Jan can be reached at jssmit@ship.edu



To find out more about Wangari Maathai and the Green Belt Movement you can go to the official web site – greenbeltmovement.org – where there are photos of events as well as many other things. See how one woman's efforts have grown to affect Africa and even our own neighborhoods and schools.

Possible talking points of Islam, from page 24

Islam has always been known as one of the world's great religions. Students wishing to understand a little bit about the basic tenets of this religion should know the following:

There are five fundamental requirements all Muslims should fulfill if possible: **(1) Shahada** – The monotheistic belief that there is only one God, Allah, and Muhammad is his messenger. **(2) Prayer** – Believers must participate five times a day, facing Mecca. **(3) Zukat** – An obligatory giving (usually 2.5%) to the poor. **(4) Ramadan** – A month of fasting during daylight hours which should cause reflection of oneself and a closeness to God. **(5) The Hajj** – If physically able, all Muslims are expected to make a pilgrimage to Mecca at least once in their lifetime.

Islam regards both Jews and Christians as “People of the Book,” since both Abraham and Jesus are recognized as prophets of the same God as Mohammed.

This photo from page 24 was given to a high school senior class. Many of the responses indicated the students felt that Islam would not stop until the entire world was Muslim. The teacher pointed out that the sign was merely a statement of faith, similar to what one might find on Christian church signs and billboards throughout the United States and elsewhere, explaining that most faiths proselytize in many parts of the world. With the increase of Muslim refugees and immigrants into the United States and our core belief in the freedom of religion, teachers will hopefully impart the understanding that is not good to jump to conclusions and that the more you know about the world, the less distrust you will have for things unfamiliar.

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