

WORKSHOP NOTES

“The Role of Tropical Ecology and Conservation
in the New England Classroom”



Saturday, October 18th, 2003
Antioch New England Graduate School

Sponsored by The Center for Tropical Ecology and Conservation
ctec@antiochne.edu

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- **Dan Bisaccio: Scientific Habits of Mind:
Conducting Biodiversity Research with Secondary School Students**

Notes

Dan Bisaccio
Souhegan High School/HabitatNet
PO Box 1152
Amherst, NH 03031
603/673-9940 x548
AEDbisacci@aol.com

- Research is part of the Smithsonian Institute
- Very expensive to send pros into the field---students are cheap, they learn and get credit while Smithsonian gets data

“Bio Swat Team”

- Dan and students meet once a week for 10 weeks before the trip
- Research site in Mexico (El Aden Ecological Reserve on the Yucatan Peninsula) is funded by WWF and others
- Students stay in huts and have solar power and full functioning weather station

“Context First, then Content Follows”

- get kids doing science first: they figure it out and come up with all kinds of questions

- 1) map trees
- 2) list questions
- 3) how do you turn questions into research projects
- 4) go at it

- have protocol for finding and measuring and tagging trees, setting up for 20m x 20m quadrats

- students also measure and monitor a female crocodile (since 1996) as well as other animals (birds, bats, mammals)

“Close Encounters with Wildlife”

- spider monkeys come for visits

- Senior research projects required for high school students are often tied with research in Mexico

- Not just day work, but night work as well

- scientific poster format for students who present at symposium every year

Methodology

1 hectare plot 100m x 100m, sub plots are 20m x 20m

- 1) measure trees (min. DBH=10cm) and tag for each 20m plot
- 2) look at species distribution, etc

do this in NH and Mexico, same research methods used...the reserve is rich in endemic species with much disturbance from people and Hurricanes

-Feed back survey from students (pre and post)

-over time there were shifts in though. Pre trip: not much interest in field work as being worth while. Post trip: much more interest in field work

Questions from Workshop Participants

-Usually take seniors from his senior seminar course in Nature and Literature...have at least 2 years of science

-Has major support from school administration: now the trip is 2 years...ConBioI=juniors and GPS, ConBioII=seniors and GIS

-use New England Habitats to Practice and do real research so the students are prepared for the Mexico trip

-any trees cannot ID- still take collections and ID leaves, bark, DBJ and call it "species A"...later ask botanist or locals for actual species name (can still do stats)

-QTAXA website has scientific names and digital photos of species and common names in Spanish and Maya

LOGISTICS

-can be done and can be done cheaply (first year is the hardest)

-Setting it UP: plane tickets most expensive

Teacher/leader becomes travel agent

Field station \$20/day for students

Some amenities (vans, etc)

Mexico is cheap place to schedule

Reserve seats \$50 per tickets without names...can have plane

tickets reserved before you know who is going

Liability:

-"school trip"...all school rules in effect

-Diver's Alert Network (DAN) insurance \$30/year for students if student becomes sick or injured (not just diving) D.A.N. will send helicopter to pick you up via MediVac (worldwide)

Paying

-individual fund raising

-some kids pay full outright

- Humanities T-shirt company...kids sell shirts and get \$
- Students contact local companies and ask for partial scholarship

Training for Teachers

- go alone with eco-tourism company to get a feel
- Eco-colors, Co. (on web...can drop Dan Bisaccio's name)
 - Kenneth Johnson, marine biologist...a Mexican company that runs customized trips for people and trains Mexicans to be guides

Timing of running Project and regular teaching

- trying to turn this as a regular class
- don't run it on spring break anymore because kids expect vacation
- go in Feb. around Martin Luther King day off week

-Tropics are great place to visit because there are so many new discoveries

-Put math in place before the trip

i.e. collect lady-bugs and start counting bugs in plots...teach Chi-square analysis

Costa Rica Study Abroad Program

Susan Ward – Educator @ Northfield Mount Hermon School

www.nmhschool.org

Notes by: Bradley Houseworth

Sue is a high school teacher at Northfield Mount Hermon School. She leads a four week long study abroad program to Costa Rica focused on fundamental ecology concepts and journal writing. Although ecology and science are the focus of the program, the journal is central to the academic procedure and a necessary tool of the program. This innovated learning program is open to juniors and seniors of the high school and is offered through the school curriculum. Costa Rica is a perfect place to study ecology because it has done such a unique job at conserving natural resources.

Northfield Mount Hermon School's trimester system is made up of 3 terms per year, each 10 – 11 weeks long. Each term is worth 2 credits in science and meets 5 days a week. The Costa Rica program encompasses the winter term and runs from just after Thanksgiving to March; including a four week long abroad trip to Costa Rica.

This winter term is split into three parts: Pre-travel, Travel, and Post-travel.

1) **Pre-travel** is three weeks long, five days a week, four hour class per day. The students are required to read six different books: 1) *Beyond Civilization: Humanity's Next Great Adventure*, by Daniel Quinn, 2) *Ecotraveller's Wildlife Guide: Costa Rica*, by Les D. Beletsky, 3) *The Future of Life*, by Edward O. Wilson, 4) *The Green Republic: A Conservation History of Costa Rica*, by Sterling Evans, 5) *A Neotropical Companion: An Introduction to the Animals, Plants, and Ecosystems of the World's Tropics*, by John Kricher, and 6) *Tropical Nature: Life and Death in the Tropics of Central and South America*, by Adrian Forsyth and Ken Miyata. All of these readings are required to be done during the pre-travel stage of the term. The students also get a quick introduction to the Spanish language by helping each other learn. In addition, the pre-travel session includes an introduction to field sketching and involves writing in a daily journal (multiple times a day). The students also complete a 'Final paper,' which involves researching a specific topic about Costa Rica before they travel to the country. Each student must give an 'artistic representation of a classification of one Costa Rica organism,' as well. Besides the other reading, the students each read a portion of the historical book, "*The Green Revolution*," and present their piece to the class. The class also participates in three main field trips before the long trip to Costa Rica: a) a winter hike together, b) Smith College Science Library, c) an overnight at a Harvard-owned forest to learn about temperate vs. tropical forests. Lastly, each student does presentations on Families of one plant and one organism from Costa Rica.

2) **Travel** consists of a busy, four-week long study abroad program in Costa Rica. After the class lands in the capitol city, San Jose, they head to the National Museum to do a tour. The program consistently integrates journal entries (including sketches as well as writing) into the daily routines of the students. This program also allows the students to manage their own budgets and buy their own groceries. The class rides in one van and doesn't need to deal with the stresses of public transportation.

Program Destinations:

-The first stop on the program is an ASACODE conservation preserve, in the SE corner of Costa Rica near the Panama border, in an area close to the town of Brie, Brie? The preserve is designed for educational groups and is composed of Primary and Secondary forest. The class hikes for forty five minutes to a lodge in the preserve to receive eco-tours from the land's caretakers.

-The next stop on the program tour is a butterfly garden near the volcano Arenal. The class learns about hydroelectric power on Lake Arenal and stays for just one night.

-The program now turns towards the San Luis Biological Station. This is a rural setting (area) with a rustic cabin set upon a farmer's homestead. The students do 'home stays' here and some help the farmer milk the cows. The educational lessons in this place are taught by Graduate students that are also staying at the station.

-The next stop is in the enchanted cloud forests of Monteverde. The students spend two nights at local family residences. The research station the students stay at the rest of the time coordinates this program with the community. Most of the families involved with the, 'home stays,' work at a coffee plantation co-op that gives an opportunity for students to pick coffee with their 'families.'

-The next adventure for the class is staying at an isolated research station on the beach of the Nicoya Peninsula for four days! They are taught by Graduate students here also but spend most of their time snorkeling and watching the tides.

-Finally, the class has an opportunity to see the dry, tropical lowland forests of Santa Rosa National Park. There are some nice bunk cabins here, along with dining hall and bathroom facilities. The students spend a week here and have a chance to do their research project (ex. the relationship between ants and acacia trees.) The class also stops at a volcano across from Santa Rosa where they are able to find some waterfall pools to swim in. Lastly, the class has a chance to check out a couple beaches along the Pacific side of Costa Rica.

3) **Post-travel** is three weeks long, five days a week, four hour class per day. After arriving back from San Jose, the class heads back to NW Massachusetts to finish up projects, field research reports, and professional journal articles. The class also analyzes the book, "*Beyond Civilizations,*" within the context of their new understanding of Costa Rica. They are involved with activities centered on themes in the book and also conduct an issue forum where each student can teach the others about their new knowledge of one Costa Rica issue.

Additional Notes:

- In addition to the regular tuition paid to go to this independent school, students who want to do the Costa program must pay \$1,350 dollars + airfare.
- There are NO current fundraising efforts supporting this trip.
- There is limited Financial Aid available via the school's International Program
- All study abroad programs at NMH cost the same price, just different lengths.
- A rather lengthy Liability Form is involved. General waiver
- Students are required to have insurance to go to NMH.
- Students still under same rules on the trips as they are in the classroom.
- On average, more girls apply for these trips than guys.
- Costa Rica is about the size of two Vermonts put together.

Picture Pals Exchange Program

Chris Doyle, Roger Williams Park Zoo

Notes by Ian Ives

Chris Doyle
Roger Williams Park Zoo
Providence, RI 02905
401.785.3510 x359

Chris started in 2000 with her first art exchange

Introduction

Video: tree kangaroos are very important to natives. They utilize all of the aspects of the kangaroo... fur, meat, culture

Goals: educate native villagers about conservation of tree kangaroos

- students from PNU hired to help with research and communicate with villagers
- create sustainable growth
- education of kids
- tree kangaroo specific research
- protect land owned by villagers
- build relationship to the end of developing a land agreement to prohibit development and focus on the program

Ed Program: was created in order to give back to Papua New Guinea village schools

Research: locations are determined by scat, study sites very remote

Researchers: 2 from Roger Williams Park Zoo, 1 from Point Defiance

Education Curriculum

- match animals with habitats
- most kids are unaware of biota of their own island
- posters were made by students for the US kids to see
- students were very focused on their studies and respected the teachers
- the kangaroo coloring book designed by Ed department at Columbus Zoo

Funding provided by CI (Conservation International) for Project

This year's curriculum

- Designed Habitat Curriculum for Village
- Native Cultures to New England (Native Americans, Algonquin Tribes)
- bugs
- regalia aspect
- connection to natural world

Rainforest Alliance: Connecting Kids to Conservation - Julianne Schrader

Notes by Jennifer Risley

Julianne Schrader
Rainforest Alliance
665 Broadway, Suite 500
NY, NY 10012
646-452-1956
jschrader@ra.org

Julianne gave CTEC a copy of her PowerPoint presentation & packet participants received

Working on refining and expanding curriculum; currently K-6; this summer adding 7-8

Activity: Migrating Birds

Essential Question: Why do birds need two homes when we only need one?

Sort birds into piles of migrating and non-migrating species; students sort using their own experiences and theories as to which migrate and which don't

Students can make a difference - Chiquita banana company wouldn't meet with Rainforest Alliance; Ranger Rick magazine did an article on banana plantations and their effects on wildlife, giving Chiquita as a company to write to; Chiquita flooded with so many letters that the company contacted Rainforest Alliance.

Mostly program adopted by individual teachers, but have two school partnerships in Newark and Jersey City (Ann St. School), NJ; hope to establish more in future

Doyle Canning: Institute for Social Ecology Biotechnology Project
Biodiversity for Sale? Teaching and Learning about Biotechnology and
Corporate Globalization in Rainforests of the Global South

Notes by Hannah Petri

1118 Maple Hill Rd
Plainfield, VT 05667
(802) 454-7138
biotech@social_ecology.org
<http://www.nerage.org>

-Technology and policies working together affecting farmers in New England and tropics

-genetic diversity (i.e. rice if huge global product) lots of variety, companies are trying to limit variety

-Frameworks and Learning Opportunities

- Interdisciplinary problem solving: social, global and economic problems

Globalization- Race to the Bottom

New England

Agriculture and forestry built local economies and strengthened rural communities

-part of our landscape, our local history

-our future?

Industrial Agriculture and Forestry:

-low wages/worker safety

-clear cut logging

-biotech monoculture and heavy chemical inputs

-transnational corporations dominate

Export Driven:

Model "Development"

-roll back of environmental laws

Factories, Ag and Forestry sectors leaving USA to Global South for cheaper labor, less strict regulations (environmental and social), no organization of workers

Trade Agreements

-WTO: World Trade organization

-NAFTA: Mexico, USA, Canada

-FTAA: Free Trade Area of Americas (34 nations from Canada to Patagonia)

-CAFTA: Central America and USA

-Bi-lateral agreements between two countries

Agreement on Agriculture

- US agribusiness subsidies undercut farmers in south (Benefits only large farmers in USA)
- most of corn, cotton, and soy from US is GMOS...USA has more GMO's than any other country
- displacement, hunger, conversion and GMO contamination
- Cheap corn from US goes to Mexico where it is cheaper to buy corn than grow it= lots of land, hunger, etc. GMO corn is planted and interbreeds/contaminates local, native corn. Mexico is epicenter for corn biodiversity. Mexico doesn't allow planting of GMO corn, but people plant the GMO corn they buy without understanding the laws.

Genetically Engineered Agriculture

Myths:

- just like selective breeding
- less chemicals, good for the environment
- higher yields, good for farmers
- feed the world

Truth: Takes stewardship of farming way from farmers and puts in on the corporations who make it a violation to save your seeds (a corporate patent on them) therefore the farmer doesn't legally own his crops

2 Kinds of GMO:

- 1) "Round-Up ready"...Monsanto sells rr seeds that are resistant to Round-Up spray so that you kill weeds, not the crops
- 2) BT...bacteria genetically in plants as bug deterrent. Make companies make more \$ from chemicals, NOT seeds

Patents and Farmers Rights

Monsanto sends goons out to harass farmers about crops and stealing GMO crops. Ex. If Monsanto patented GMO crops cross pollinate with neighbor farmer's crops, the neighbor farmer is sued by Monsanto for stealing GMO patent. Most farmers cannot afford this, so Monsanto makes them sign an extortion letter as well as a gag order (farmers not allowed to talk). The problem: most farmers don't know their crops have been contaminated or that they are signing an extortion letter.

TRIPS= Trade Related Intellectual Property

- Part of WTO and pertains to:
 - a) genetically engineered organisms
 - b) pharmaceuticals
 - c) indigenous wisdom

Ex. A company patents organism genetics and the knowledge of what it is used for---if a woman uses an organism to make a traditional product, she is technically in violation of that intellectual property right.

Patents and Biodiversity

- Patents on life
- “green gold”
- bioprospecting..ie company investigates a root a Shaman uses, takes it to the lab and manipulates it...patents it yet the Shaman gets nothing
- Biopiracy

Water Privatization

- GATS: General Agreement on Trade Services (WTO)
- Services= public sector, education, health care and WATER
- “water wars” = blue gold

FTAA= NAFTA on Steroids

- “Chapter 11” = corporations sue governments for lost profits currently and into perpetuity (part of NAFTA)
- Flooding Latin America with GMO's
- service, TRIPS Plus (Moving TRIP's further)
- militarization of the region

CAFTA and Plan Puebla Panama (PPP)

- CAFTA: 6 Central American Countries
- PPP Mega projects: highways, high speed railway, export zones
- “Meso-American Biological Corridor”

i.e. textile manufacturing is huge in Pacific to ship the Panama Canal is small and antiquated. Corporations want to put in a major transport infrastructure through entire country. Means deep coastal dredging and major environmental disturbance...major old growth rain forests, cloud forests, and biodiversity in Costa Rica.

Global Responses

- Meso-American Foro
- Via Campesina
- Biosafety Protocol (came out of UN)
- Campaigns and Mobilizations against GMO's, Biopiracy, etc

Local Responses

- “town to town” campaign- getting towns to pass resolutions against having GMOs in towns
- GEFREEVT.org
- NERAGE.org
- Vermont Workers center.org
- FTAA Balloting
- Supporting local farmers

“Washing one's hands of the conflict between the powerful and the powerless means to side with the powerful, not to be neutral.”—Paolo Friere

“Education is a political Act.” – Paulo Friere

Websites:

www.lstopftaa.org

www.asej.org (PPP..802-863-0571)

www.nerage.org

www.gefreevt.org

www.geaction.org (lots of links)

Books

Seeds of Deception by Jeffrey Smith focuses on health aspects and cites good studies.

Discussion

- Big and upcoming products: GMO rice and wheat
- it's important to seek out info yourself because it is not given out (go directly to the source)
- environmental legislation is “under the gun” by major corporations and organizations (WTO, etc)...fear of being sued
- organic industry is a huge ally against GMO's
- National Organic Farmers Association (NOFA)

For more info from workshop presentation, see website

www.nerage.org

Ford/Sears Workshop Notes

Rainforest Realities: Making Broad Ecological Connections Between New England and the Tropics

Notes by Elizabeth Elliott

Mary Ford
Institute of Ecosystem Studies
Box R, 181 Sharon Turnpike
Millbrook, NY 12545
845.677.7600 x323
fordm@ecostudies.org

Robin Sears
Center for Environmental Research &
Conservation
1200 Amsterdam Av, MC 5557
New York, NY 10027
212.854.8253
rrs26@columbia.edu

1) Draw with crayon a picture of the rainforest

*Important for kids to learn about places near to home and far away...the wide world.
It's important to understand ecosystems.

2) Share name and picture.

- Are there lakes? A lot of lakes in the tropics are oxbow lakes.
- People who lived/spent time in the tropics had more detail and even named species

3) Power Point presentation: Robin Sears (*did PhD work in Amazon*)

- There are many types of rainforests, as there are many types of northern forests
- Flood plain forest does not have a lot of understory, similar to here
- Fallow forests have only 1 or 2 species of tree
- Examples of species showed diversity
- Robin worked with farmers who mostly did subsistence farming...all sorts of farming systems
- People use the rainforest for: paddles (from buttress roots), timber, and food sources
- Compare deforestation rates between New England and Tropics
 - New England Map: scattered development
 - Tropical Map: development only around city
- Compare forest structure by regions: rainfall, Temp, Density, Basal area of trees, species richness

4) Questions?/Comments

- Have you ever compared productivity over time/annually between the two regions?
Answer: In NE we think of net productivity on an annual basis, in the tropics we think of it on a daily balance

-Look at aerial photos which you can access on map quest to show change and to change perspective

- 5) Brainstorm: What is an ecosystem? What are some of the interactions in an ecosystem?
- organisms and non-living things and how they live together
 - Example with kids: give them clay and ask them to build an ecosystem
 - Pond ecosystem board: pond drawn on board with Velcro animals...ask kids to name a component of ecosystem and have them Velcro it to board
- 6) Difference between soil types and nutrient cycling in time frame
- Example: litter bag
- Staple together needle point fabric and fill with litter. Experiment with decomposition. Put clear transparency with grid on it over bag to measure change. Try this inside and outside, dry and moist...use different environmental conditions between temperate and tropical forests
- 7) Handout: Ecosystem Scavenger Hunts
- from The Catskill Center (on the web): A Sense of Place
- 8) Small Groups: Think about the value of forests
- 4 groups: 2 temperate, 2 rainforest
 - services, goods, cultural values
- 9) Outside
- Handouts: Tree transects, biodiversity counts, nature reserves, species area curves, light gaps

Activities on the Internet

www.ecostudies.org/syefest/ap1hunt.htm
www.ecostudies.org/syefest/ap1res24.htm
www.ecostudies.org/syefest/ap1res22.htm
www.ecostudies.org/syefest/ap1res20.htm
www.ecostudies.org/syefest/ap1res7.htm
www.ecostudies.org/syefest/ap1res3.htm