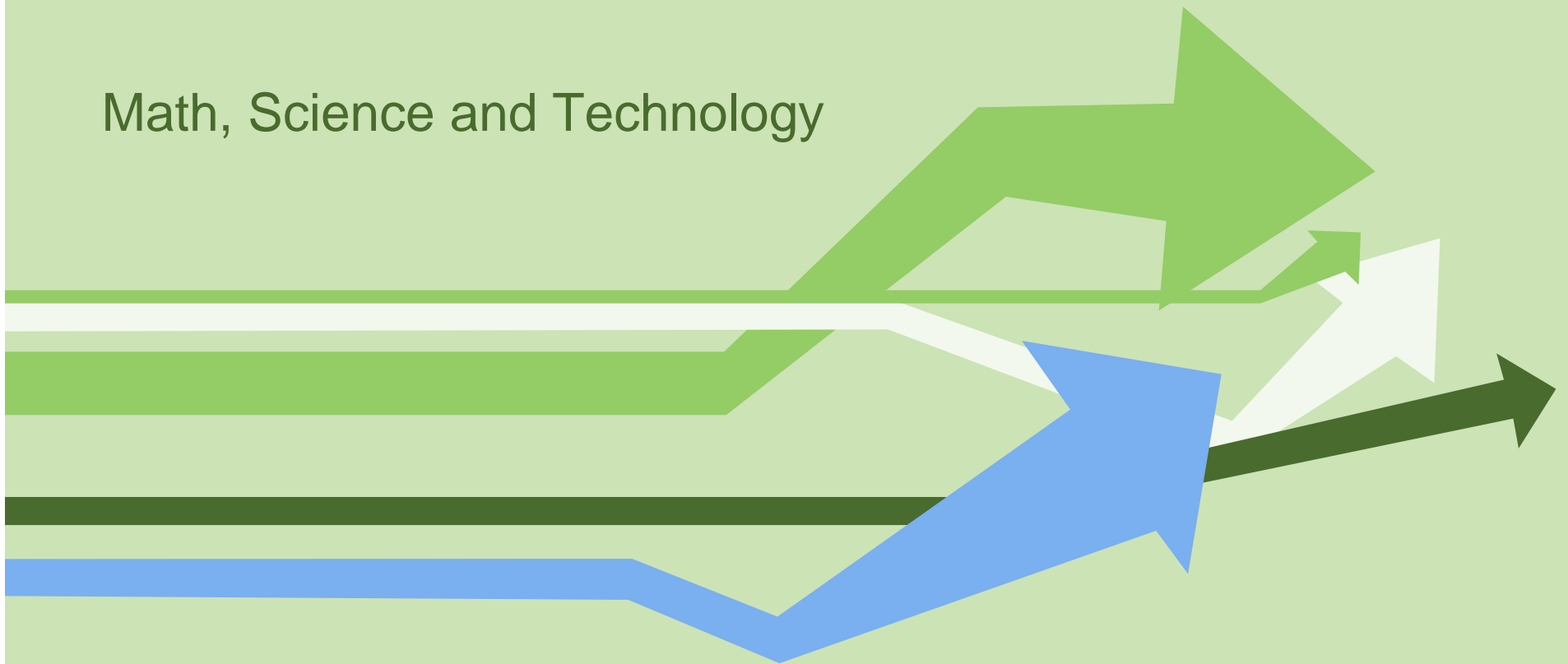


Integrating Environmental Science

Math, Science and Technology

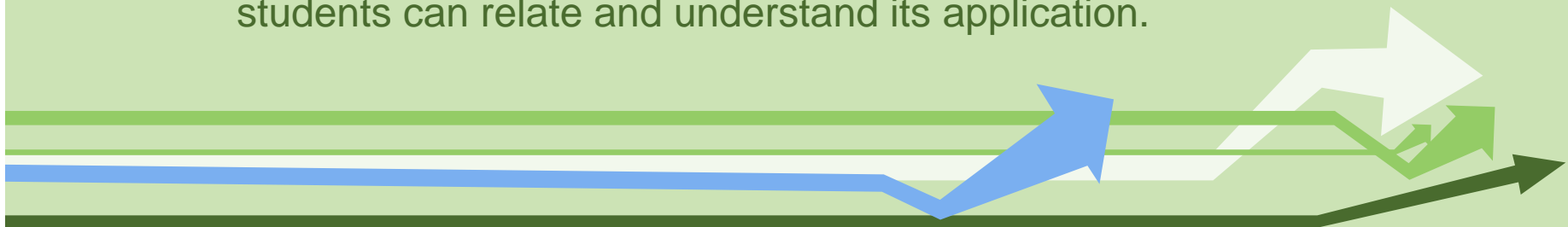


Environmental Science



- Why to integrate

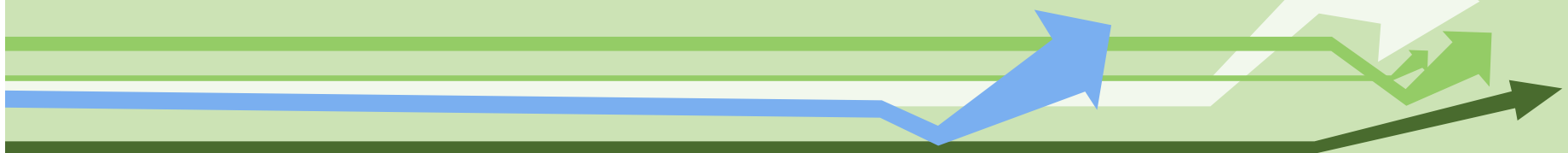
- The integration of mathematics, science, and environmental education permits the students to gain from all three areas simultaneously.
 - Science encompasses the art of questioning, investigating, hypothesizing, and discovering.
 - Mathematics is the language that provides clarity, objectivity, and understanding.
 - Technology provides the tools to increase productivity and provide manipulatives for implementation
- Many of the major contemporary issues involve societal issues stemming from advancements in science (Wiebe, Ecklund, & Hillen, 1986).
- By increasing awareness and making a more effective use of classroom time we may get closer to producing information that students can relate and understand its application.



Alignment to standards



1. Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate to pose questions, seek answers, and develop solutions.
2. Students will access, generate, process, and transfer information using appropriate technologies.
3. Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.
4. Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
5. Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.
6. Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.
7. Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

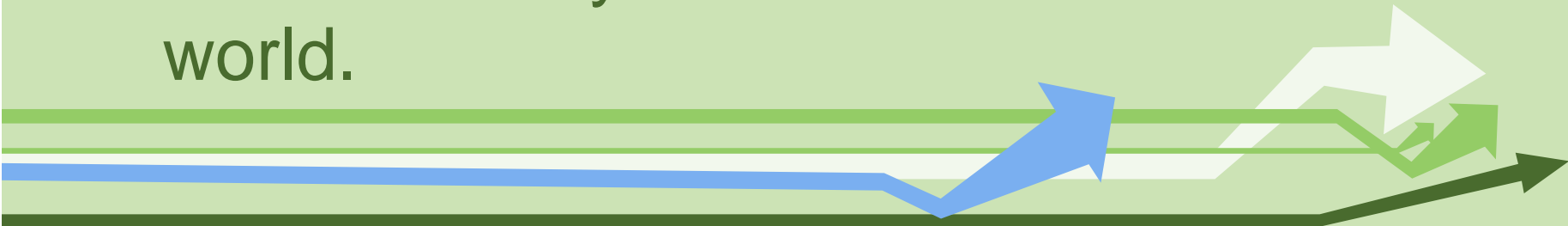


Google Earth



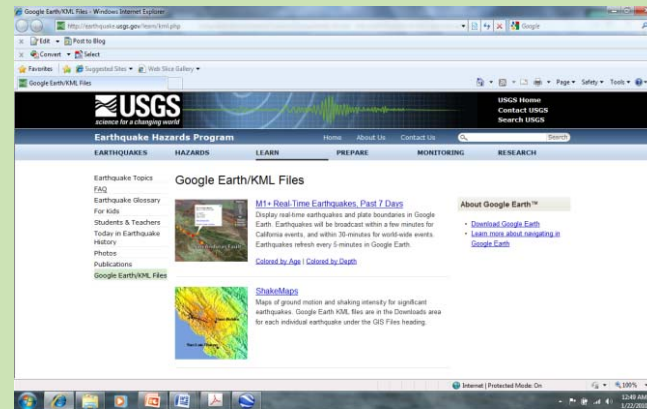
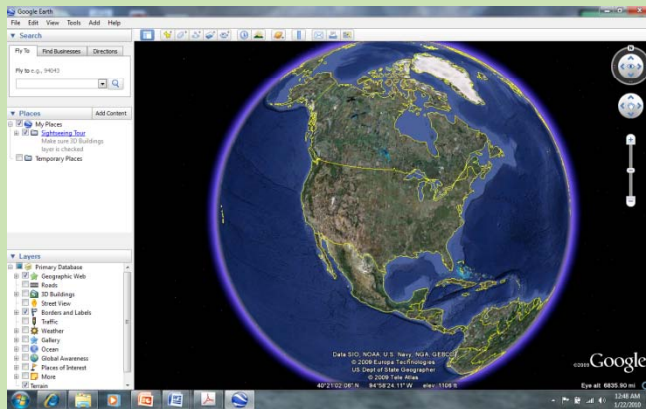
Earthquake! USGS & Google Earth



- Introduce students to plate tectonics with the multimedia elements in the Google Earth tours created by the United States Geological Survey. Students explore, analyze and create scenarios as they learn about seismic activity both past and present in the San Francisco Bay Area and around the world.
- 

Earthquake! usgs & Google Earth

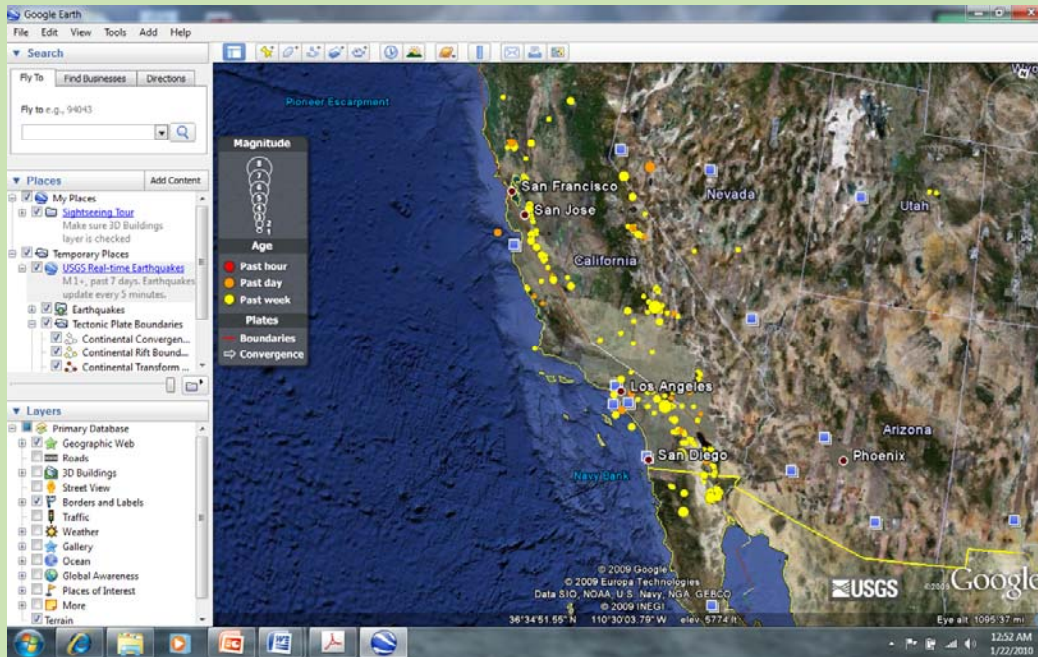
- Start with USGS Earthquake Hazards Program in Google Earth
 - <http://earth.google.com/>
 - http://earthquake.usgs.gov/research/data/google_earth.php
- Set up a series of questions to start the initial exploration of the USGS Google Earth tours.



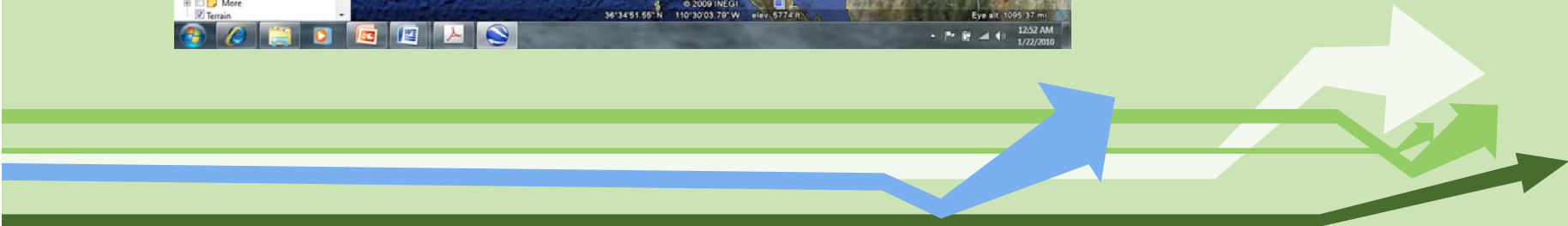
Earthquake! usgs & Google Earth

- USGS Real Time Data

- <http://earthquake.usgs.gov/eqcenter/catalogs/eqs7dayage.kmz>



eqs7day-age.kmz

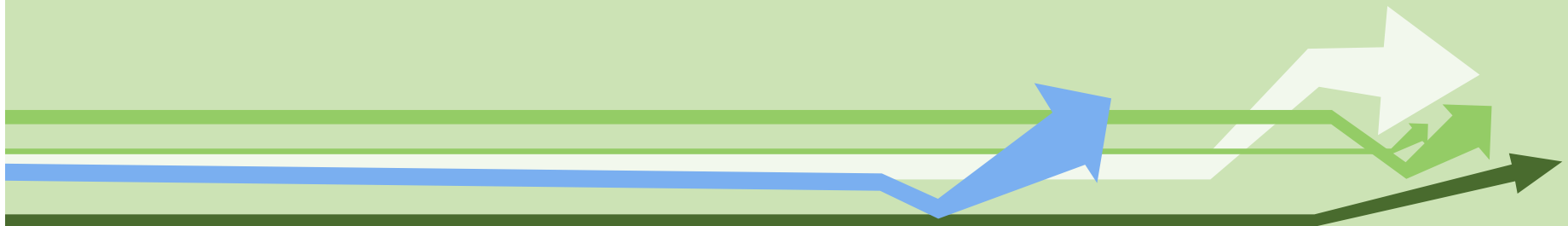


Earthquake! USGS & Google Earth



- Analysis questions

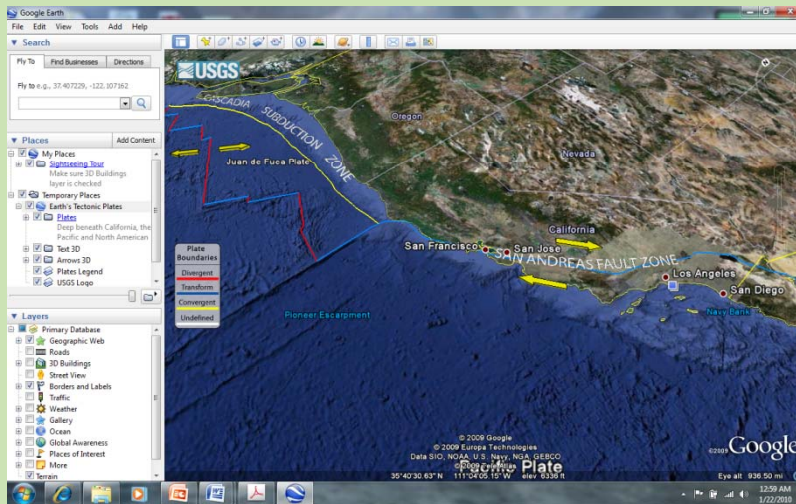
- In the last seven days locate the largest and smallest earthquake in California.
- How many EQs within the last day?
- How many EQs within the last hour?
- How many EQS within the last week?



Earthquake! usgs & Google Earth

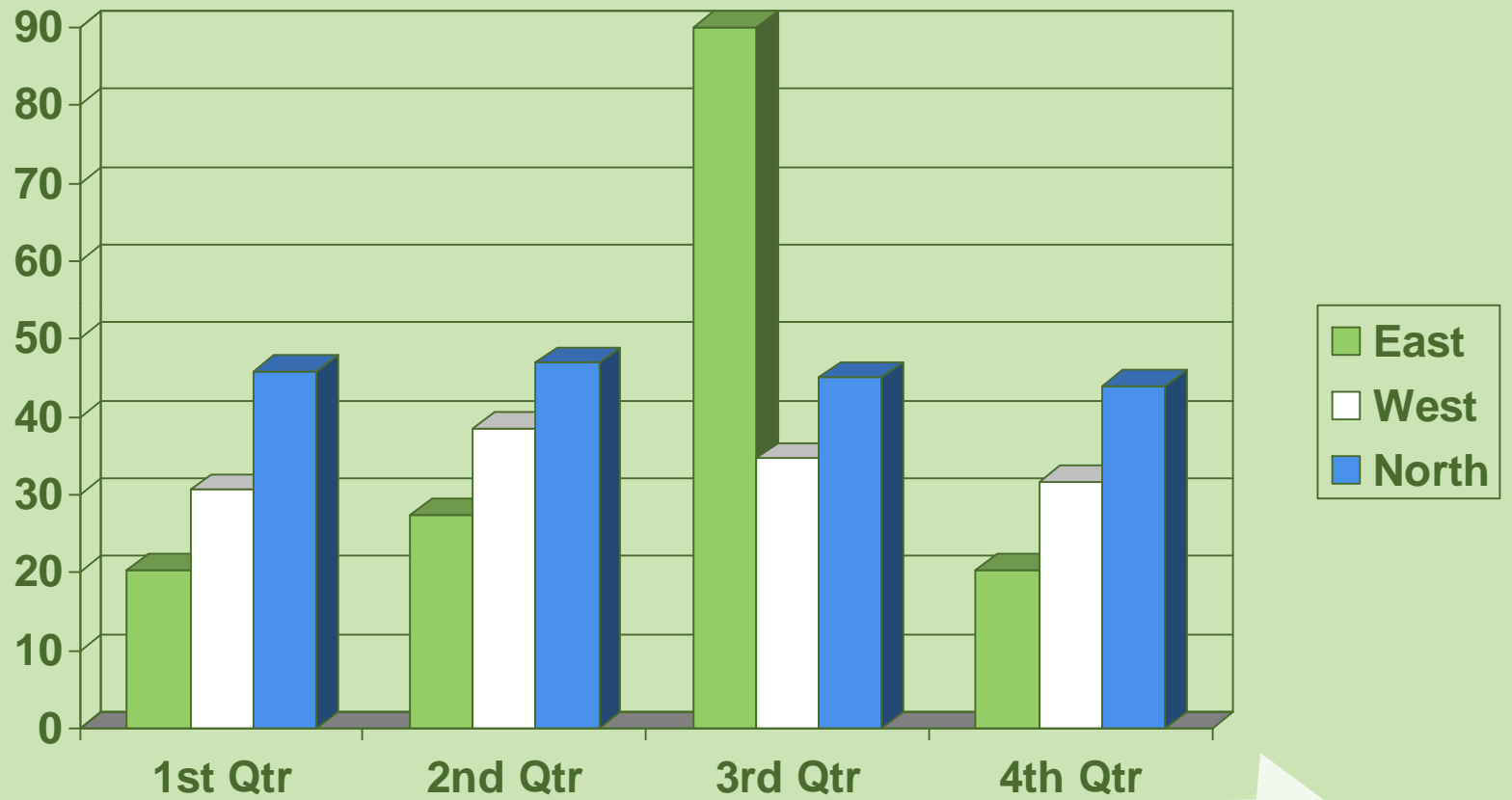
- Earth Tectonic Plates

- http://earthquake.usgs.gov/regional/nca/virtualtour/kml/Earths_Tectonic_Plates.kmz
- Why are some plate boundaries undefined?
- What is plate subduction?



Earths_Tectonic_Plates.kmz

Sample Graph (3 colours)



Carbon Footprint – Carbonfund.org

- Individual Carbon Offsets

The screenshot shows the Carbonfund.org website interface. At the top, the logo and tagline "REDUCE WHAT YOU CAN OFFSET WHAT YOU CAN'T" are visible, along with a navigation menu. A banner at the top right states: "Arctic sea ice loss from 1979 to 2003 equaled an area greater than the combined size of TX & CA". Below the navigation, a central message reads: "A whopping 50,000 pounds a year! That's the average American's total carbon footprint which includes the emissions from your home, car, air travel and everything you use. Be a leader in the fight against climate change: [calculate](#) your carbon footprint (or select a preset) and [offset](#) it today!". Below this, it lists "What You Get: e-certificate, bumper sticker, window decal, pen." and a photo of a forest with the caption "Return to Forest, Rivas, Nicaragua".

The main content area is divided into three numbered steps:

- 1 Select an activity to offset**: A sidebar contains buttons for Home, Car, Flight, Train/Bus, Zero CO₂, Gift, and Event/Wedding.
- 2 Select a preset value OR use our Calculators**: A large empty box for user input.
- 3 Send your offset list to the checkout**: A "Shopping List" table and a "Add a Custom Donation" form.

Item	Tons CO ₂	Cost
Total	0.00	\$0.00

Below the table, there is a form for "Add a Custom Donation" with the text "Enter your tax-deductible donation:" and a text input field containing "\$ 0". A green button labeled "Offset your Footprint now!" is positioned below the form.

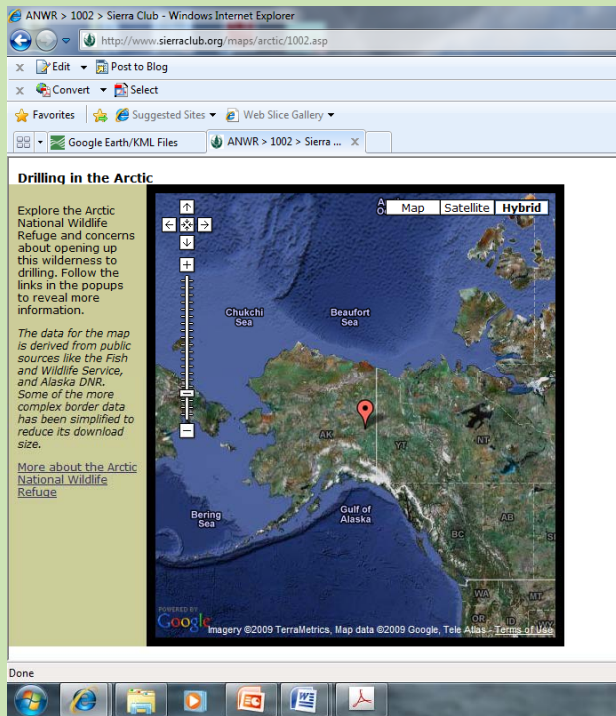
Carbon Footprint – Carbonfund.org

- A carbon offset represents a reduction in emissions somewhere else like a renewable energy or a reforestation project to balance out the emissions you cannot reduce.
- Also, carbon offsets are the only way to get your carbon footprint to zero today.
- You Calculate and Offset your Carbon Emissions.
- Use carbon calculator to figure out your carbon footprint or choose from one of our preset options.

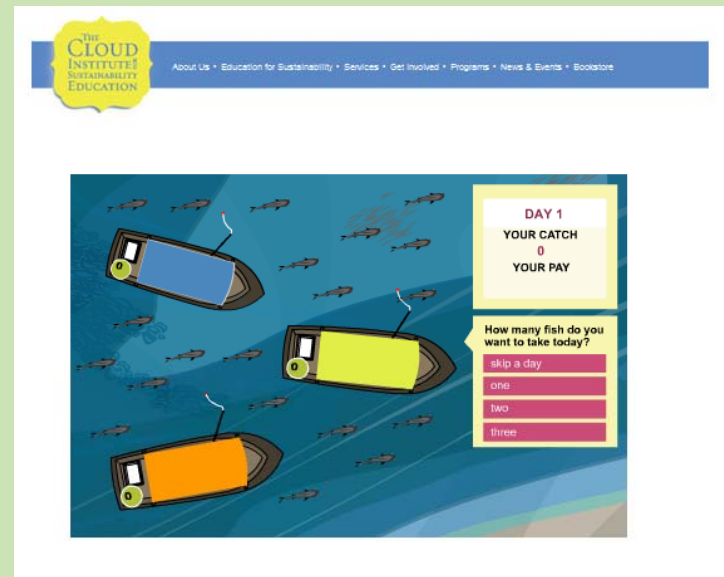


Projects

- Explore the Arctic with Google Earth

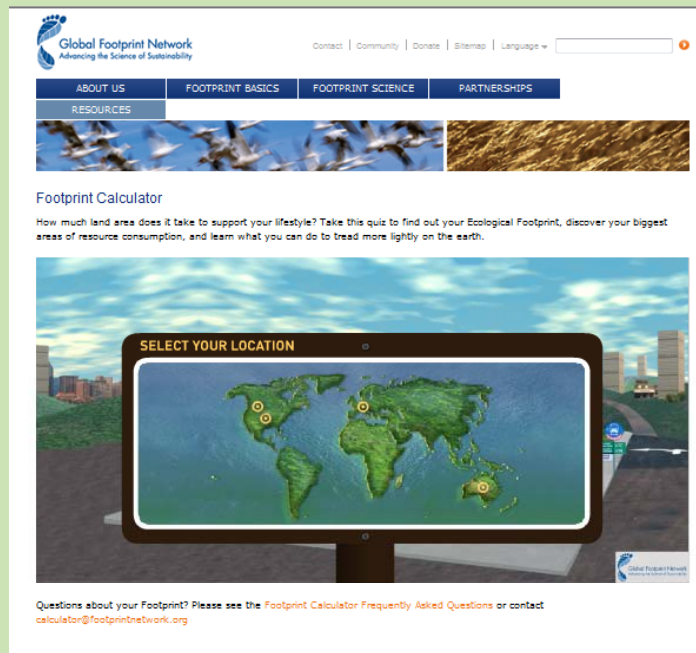


- Play the Fish Game



Projects

- Carbon Footprint
- Power Up



The screenshot shows the Global Footprint Network website. At the top, there is a navigation menu with links for 'ABOUT US', 'FOOTPRINT BASICS', 'FOOTPRINT SCIENCE', and 'PARTNERSHIPS'. Below this is a 'RESOURCES' section with two images: one of birds in flight and another of a field. The main heading is 'Footprint Calculator', followed by a brief description: 'How much land area does it take to support your lifestyle? Take this quiz to find out your Ecological Footprint, discover your biggest areas of resource consumption, and learn what you can do to tread more lightly on the earth.' Below the text is a large image of a computer monitor displaying a world map with several locations marked with yellow circles. The text 'SELECT YOUR LOCATION' is visible above the map. At the bottom of the page, there is a footer with contact information: 'Questions about your Footprint? Please see the Footprint Calculator Frequently Asked Questions or contact calculator@footprintnetwork.org'.



The screenshot shows the website for the game 'PowerUp'. The top navigation bar includes links for 'home', 'game info', 'downloads', 'faqs/contact us', 'gallery', 'parents', 'teachers', and 'credits'. The main content area is divided into several sections: 'EXPLORE POWERUP!' with a list of bullet points (Save Planet Helios from ecological devastation!, Exciting 3D, action-strategy game, Meet new friends, Download and Play for FREE) and a link to 'Read Game Info'; 'DOWNLOAD NOW' with buttons for 'Win 98/ME/XP/Vista' and 'Mac OS X'; 'COOL NEWS!' with a sub-heading 'PowerUp is now available on Mac OS.'; 'COMMENTS' with a quote from a 15-year-old student; and 'VIEW GAME SCREEN SHOTS' with a row of four small images and a 'more>>' link. The footer includes logos for IBM and tryScience, and a copyright notice: '©2008 TryScience/How You Help of Science'.

Projects

- Hippocampus

The screenshot shows the HippoCampus website homepage. At the top, it says "Your Free One-Stop Educational Resource". The main content area features a "Welcome to HippoCampus™" message and a "Subjects" list including Algebra, American Government, Biology, Calculus, Environmental Science, Physics, Psychology, Religion, Statistics, and US History. There are also sections for "Instructors" and "Scholarships College Search Test prep".

- Monterey Institute

The screenshot shows the National Repository of Online Courses (NROC) website. It features a navigation menu on the left with options like "NROC Home", "What is NROC?", "Access to NROC", "View Repository", "NROC Membership", "NROC License", and "HippoCampus". The main content area includes a "Welcome to NROC" message and a table of "Available Courses".

Advanced Placement* Content	College Course Foundations	High School Course Foundations
US Government and Politics for AP US History I for AP US History II for AP	American Government Psychology Relations of the World Statistics for Social Sciences US History I US History II	Algebra IA Algebra IB Algebra IS (Spanish) Algebra IS (Spanish)
Biology I for AP Biology II for AP Environmental Science for AP Physics B I for AP Physics B II for AP Physics C I for AP Physics C II for AP	Non-Major Biology Environmental Science Introductory Physics I Introductory Physics II General Physics I General Physics II	College Preparatory Physics I College Preparatory Physics II
Calculus AB I for AP Calculus AB II for AP Calculus BC I for AP Calculus BC II for AP	Elementary Algebra Introductory Calculus I Introductory Calculus II General Calculus I	

Thank you!



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