

Website Links presented at OAME February 2007 **Board Meeting – PD Session**

GREETINGS MATHIES AND ENVIROMENTALISTS (or soon to be)

Board members used the following extensive list of websites, and brief descriptions of each, during the PD component of our OAME February Board meeting.

If you know of any other websites that provide information or data on Climate Change, Global Warming or other environmental issues, please share them with me. I hope that we can incorporate important real life data into our mathematics curriculum that will enable students to both learn mathematics and have a greater appreciation for our delicate planet.

At the meeting, members were asked to visit some of these sites and to try and create a math lesson or activity. The websites will then be posted on the OAME website, along with any activities developed, so that classroom teachers can make use of them. I hope that teachers will then develop and share their activities with OAME members by having them posted on our website.

Dan Charbonneau

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) <http://www.noaa.gov/>

The US Department of Commerce National and Atmospheric Administration website has plenty of information on research, weather, climate, oceans and fisheries for the US. In particular, the “Climate-At-A-Glance” link enables one to search 108 years of archived weather data for the US. The National Climatic Data Centre (NCDC) site, located at <http://www.ncdc.noaa.gov/oa/climate/research/cag3/cag3.html>, lets you search for and graph temperature and precipitation data for national, regional, state or city regions. Using this site enables you to explore weather trends in the USA to see if the data supports global warming concerns.

NATURAL RESOURCES DEFENSE COUNCIL <http://www.nrdc.org>

The Natural Resources Defense Council website does not offer data and graphs but is a wonderful site to discover what simple steps each of us can do to decrease pollutants that cause global warming. It also shows how global warming is leaving its marks in western US National Parks with several before and after photos. The Kids Make Wave link lets kids get involved in areas of recycling, cleaning waters and oceans.

LESSON PLANET

<http://www.lessonplanet.com/>

Lesson Planet is a search engine for teachers that having over 80,000 lessons you can access for JK to 12. Although US based, many lessons are of Canadian content. A free ten-day trial lets you decide if you wish to pay the \$25 annual fee. There are many environmental lessons available on topics such as: Global Climate Change (180), Trash and Recycling (43), Land Use (1600), Water and Pollution (69), Acid Rain (67) and over 2000 Math lessons.

AN INCONVENIENT TRUTH

<http://www.participate.net/educators/>

A free educators resource to accompany the Al Gore film “An Inconvenient Truth” can be downloaded at this website once you register. It includes a one-day lesson where students are challenged to examine their personal activities and estimate their own impact, while finding ways to reduce damage to our environment or semester-long program that is highly project-based. After discussing climate change and renewable energies, students will interact with large sets of scientific data and draw conclusions from those interactions. You may choose to focus on the data and integrate it into your math program.

US ENVIRONMENTAL PROTECTION AGENCY

<http://www.epa.gov/>

This website has an enormous amount of information and many links. Try the links to “Climate Change” and then “What Can I Do?” which bring you to <http://www.epa.gov/climatechange/wycd/index.html> where you can go to one of four links on reducing greenhouse gases at home, at work, on the road and at school. The “At School” link has great activities and projects for students, educators and administrators. The “Educators Link” is a searchable database offering links to resources such as lesson plans, videos, books and toolkits. Visit the “EPA Climate Change Kids Site” for games and activities.

US DEPARTMENT OF ENERGY

<http://www.energy.gov/foreducators.htm>

This “for educators” link of the US Department of Energy provides information on age-grade and subject matter resources for "energy" to help point students along the path of learning. In “Tidepool Math” students use a plot of a mussel bed to better understand the applications of counting and estimating, while learning about the environment through exploration.

ENVIROLINK.ORG NETWORK

<http://www.envirolink.org/external.html?www=http%3A//www.epa.gov/teachers/&itemid=20000504100338815771>

This online environmental community has many links to select from. The one above lets you access Air Pollution Measurements and Sources in the USA over several years for emissions like carbon monoxide, nitrogen and sulfur dioxide and ozone.

WE ARE THE WEATHER MAKERS

<http://www.theweathermakers.com/learn/>

“We Are the Weather Makers - The Story of Global Warming” was written by Australian Tim Flannery. This site includes learning and teaching resources teachers can use in a variety of subject areas, including math (Number Sense and Data Management), in conjunction with the book. This book is a great read as is his other book “The Weather Makers - The History and Future Impact of Climate Change”.

EARTHTRENDS

<http://earthtrends.wri.org/>

EarthTrends is an online collection of information regarding the environmental, social, and economic trends that shape our world. Committed to the principle that accurate information drives responsible decisions by governments and individuals, EarthTrends offers the public a large breadth of statistical, graphic, and analytical data in easily accessible formats. This is a very good resource for world data analysis of climate, water, marine, population, energy, economics and wealth and is a “must bookmark” for all elementary and secondary teachers.

CBC WEBSITE

<http://www.cbc.ca/quirks/archives/02-03/nov16.html#1>

This link to the CBC Quirks and Quarks audio archives such as Climate Change, Ice Cores from Kilimanjaro and China Black (soot over China) enables teachers to play audio clips to students and have them support or refute the information presented.

CANADIAN GOVERNMENTAL WEBSITES

The following information that contains links to resources on global warming and other environmental issues and short descriptions of each link were assembled and provided by Patrick Adams from the Environment Accounts and Statistics Division of Statistics Canada. They are grouped into four major governmental departments: Statistics Canada, Environment Canada, Government of Canada and Natural Resources Canada.

STATISTICS CANADA (STC)

Search by Subject: “Environment”

A general reference for environment statistics and information at Statistics Canada can be found in the *Search by Subject* portal of the STC website. For data and publications on a variety of environment-related topics, click on “Environment” within this page:

<http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&CORCmd=GetTList&ResultTemplate=SrcH1>

Learning Resources site at STC

STC’s Learning Resources site (<http://www.statcan.ca/english/edu/index.htm>) provides support for teaching and learning in schools. Teachers can connect to data, reference material, lesson plans and teaching tools. Students can access data and information for assignments and projects. University students can find data and programs to support in-depth research, teaching and learning, including the Data Liberation Initiative (DLI) and Research Data Centres (RDCs). Relevant teacher’s kits may include the following:

Human Activity and the Environment Teacher's kits in Learning Resources

<http://www.statcan.ca/english/kits/human.htm>:

- The Learning Resources site contains three new teacher’s kits designed to help students learn about Canada's natural resources, ecosystems, population, economy and responses to the impact of human activity on the environment. One of these kits entitled “Annual Statistics,” helps students develop their graph and data analysis skills as they convert data tables from Human Activity and the Environment into graph form and interpret the results. See as well kits dealing with solid waste and energy use; the later features an exercise that teaches students how to reduce energy consumption in the home.
- The Human Activity and the Environment 2000 Teacher’s kit provides educators with a variety of activities designed to support the integration and use of the Human Activity and the Environment 2000 publication and available environmental data at Statistics Canada in curriculum-based classroom applications. Activities included cover six chapters of Human Activity and the Environment 2000, including **Current Environmental Issues**; **Natural Background** (Canada's physical features and climate); **Driving Forces** (that shape the relationship between human activities and the environment); **Natural Resources; Ecosystems and Well-being** (focusing on issues such as wildlife status and air quality); and **Responses and Participation** (how governments, businesses and households respond and adapt to environmental change)

Canadian Agriculture at a Glance Teacher’s kit

(<http://www.statcan.ca/english/kits/agric04/intro.htm>) features several lessons on Agriculture and the Environment; the related Canadian

Agriculture at a Glance issue also includes an article focusing on greenhouse gases.

E-STAT

E-STAT is Statistics Canada's interactive learning tool designed with the needs and interests of the education community in mind. E-STAT offers a large warehouse of reliable and timely statistics about Canada and its ever-changing people, including a host of environment related statistics.

<http://www.statcan.ca/english/Estat/licence.htm>

The E-STAT online database enables the user to access a wide range of published statistical data, select and format the data, and export it easily into a document or presentation software.

Among other sources, [E-STAT](#) includes information from:

- [CANSIM](#) (Canadian Socio-economic Information Management System)
- [Census of Population, Agriculture](#) and [Search map 2001](#) (data updated every five years)
- [Human Activity and the Environment](#) (updated annually)
- [Aboriginal Peoples Survey](#) (updated every ten years)
- [Canada Food Stats](#) (updated twice a year)
- [Health Behaviour in School-Aged Children](#) (data updated every four years on CANSIM)

The HTML version of Human Activity and the Environment 2000 contains a spatial analysis tool known as EcoGraf, which brings together a wide range of geographic information. EcoGraf gives users access to georeferenced data, which you can be used to visualize and analyse information on population and agriculture. EcoGraf lets students create bitmap images (BMP) and printed maps and graphs for use in reports and studies. The spatial database accessed by EcoGraf comprises 37 georeferenced variables from the censuses of Population and Agriculture spanning the period 1971 to 1996.

Ecograf is accessible only on the CD-ROM version of HAE 2000. The HAE 2000 Book and CD-ROM package are available at a deep discount for teachers. See:

<http://www.statcan.ca/english/ads/11-509-XPE/index.htm>

For information on how to register for ESTAT, see

<http://www.statcan.ca/english/Estat/step-re.htm>

Canadian Environmental Sustainability Indicators Report

<http://www.statcan.ca/bsolc/english/bsolc?catno=16-251-X> This annual report presents environmental indicators for water quality, air quality, and greenhouse gas emissions. The indicators are intended to assist those in government responsible for developing policy and measuring performance, while also helping individual Canadians understand more about the trends in their environment. (Also available through the Government of Canada website, as noted below)

Canadian Environmental Sustainability Indicators: Socio-economic Information

<http://www.statcan.ca/bsolc/english/bsolc?catno=16-253-X> Provides supporting information to the main Canadian Environmental Sustainability Indicators report. This report provides contextual information on the human activities that have influenced the environmental indicators. Socio-economic information is divided into three broad categories: land, population and economy. Selected data from the Censuses of Population and Agriculture are also provided in the form of regional profiles for major drainage areas and sub-drainage areas of Canada.

Greenhouse Gas Reduction Technologies: Industry Expenditures and Business Opportunities <http://www.statcan.ca/bsolc/english/bsolc?catno=16-001-M&CHROPG=1>

This paper evaluates Canadian industry performance in adopting and developing greenhouse gas (GHG) technologies. It addresses issues concerning business investments in GHG technologies, domestic and international market access for Canadian GHG technology producers, and the process of innovation for GHG technology development. The analysis is based on the results of the 2002 Survey of Environmental Protection Expenditures (SEPE) and the 2002 Environment Industry Survey (EIS).

ENVIRONMENT CANADA (EC)

Envirozine

http://www.ec.gc.ca/envirozine/english/home_e.cfm

Environment Canada's monthly on-line news magazine covers a wide range of current environmental issues of interest to Canadians. Users can access past EnviroZine articles by using the Browse by Subject feature, which is organized into the following categories: Air, Climate Change, Environmental Action, Nature and Wildlife, Pollution, Science & Technology, Water, and Weather. Inspiring environmental success stories, as well as innovative tools and ideas for individuals and community groups aiming to improve the environment, are available through the Get Involved section.

EC Educational Resource Guides

http://www.ec.gc.ca/edu_e.html

A series of resource guides on air, pollution, water, weather and meteorology, and action and learning.

Project Atmosphere Canada (PAC) Teacher's Guide

http://www.msc-smc.ec.gc.ca/education/teachers_guides/index_e.html)

Project Atmosphere Canada is a joint venture of Environment Canada and the Canadian Meteorological and Oceanographic Society (CMOS) aimed at teachers in the primary and secondary schools across Canada. The website covers a variety of weather-related material, providing teachers with background knowledge, as well as interesting activities related to the topics covered.

Games/Entertainment

http://www.ec.gc.ca/quiz_e.html

Links to EC quizzes on ozone and weather. Also provides links to EC websites targeted at youth. The subjects of these websites range from water to nature and wildlife, to pollution prevention information for youth.

Databases

http://www.ec.gc.ca/data_e.html

Links to databases grouped into the following subjects: Nature and Wildlife, Pollution, Sustainable Development, Water, and Weather and Meteorology.

Meteorological Service Canada Educational Publications

http://www.msc-smc.ec.gc.ca/education/teachers_guides_e.cfm

This website provides detailed meteorological information on the climatology, weather and the atmosphere. While there is background information available on a variety of topics, the learning resources on this site may be better suited to weather enthusiasts.

Space for Species Teacher's Guide

<http://www.spaceforspecies.ca/>

Web-based learning program that brings science and technology to life. This hands-on, interactive experience is aimed primarily at grades 6 through 9. All materials required by users are available at the Web site and are meticulously prepared with young readers in mind. They are both teacher- and student-friendly.

Hinterland Who's Who

http://www.hww.ca/index_e.asp

Hinterland Who's Who is a very user-friendly website which contains species information that is organised into amphibians and reptiles, birds, mammals, insects, species and risk, boreal forest species, and fish and mollusc categories. The website also describes the various habitats that can be found in Canada and includes a Things You Can Do section, which lists many practical ideas that individuals can implement to help Canadian wildlife. The For Educators section contains a variety of lesson plans for kindergarten to high school aged youth, to inform them about conservation concepts such as biodiversity, sustainability, ecosystem conservation, and endangered species recovery.

Climate Change (EC's Climate Change site)

<http://www.ec.gc.ca/climate/home-e.html>

This website gives a good introduction to the issue of climate change. The Overview section tackles issues such as “What is climate change?”, “The science of climate change” and “How climate change affects you.” The Taking Action section links to the “What You Can Do” website, which contains information on the small changes we can make in our everyday lives to reduce our impact on the environment.

Monitoring, Accounting and Reporting on Greenhouse Gases

http://www.ec.gc.ca/pdb/ghg/ghg_home_e.cfm

“Monitoring, Accounting and Reporting on Greenhouse Gases” gives an in-depth look at the legislation surrounding Canada's international commitments with respect to greenhouse gases (GHG) and the guidelines that are used in GHG reporting. The website also contains links to searchable databases of Canadian GHG emissions, as well as links explaining the concepts of the greenhouse effect and carbon sinks.

Climate Trends and Variations Bulletin

http://www.msc-smc.ec.gc.ca/ccrm/bulletin/national_e.cfm

The bulletin contains data about Canadian temperature and precipitation trends over the last year, at both national and regional scales. The data are used to put the most recent season and year in historical context by comparing how wet or dry they were, or how warm or cold they were, to past seasons and years.

GOVERNMENT OF CANADA

Canada's school net

<http://www.schoolnet.ca/home/e/>

This page contains links to Sustaining the Environment (see below) as well as links to Canadian Geographic and Learning Resources. The Learning Resources link takes the user to a list of curriculum areas through which they can find information relating to Earth Science and Geography (among a variety of other topics) information, from a Canadian perspective.

Sustaining the Environment

<http://www.environmentandresources.ca/default.asp?lang=En&n=8A53D13B-11>

The Sustaining the Environment website covers a broad range of environmental topics such as air, climate, freshwater, health, land, oceans, pollution, sustainable development, indicators, and weather. Background science information, relevant issues and possible solutions are available from this website for all of these topics. Sustaining the Environment also contains a section on Aboriginal peoples, as well as a youth section with links to various environment websites targeted at youth.

NATURAL RESOURCES CANADA (NRCAN)

NRCAN kids site

http://www.nrcan-rncan.gc.ca/kids/index_e.html

Links to information on geography, science and technology, nature and environment, history as well as resources for parents and teachers, and a link to games and quizzes.

Office of Energy Efficiency

<http://oee.nrcan.gc.ca/english/>

The Office of Energy Efficiency website contains a variety of information, ranging from energy conservation strategies for homes and businesses, to regulations and standards information for various products. The website also has a Statistics and Analysis section which allows access to energy databases and energy data publications. The website also has a link For Kids which contains information on energy conservation, as well as games and quizzes. From this section, there is a section For Teachers, which links to information on energy efficiency and climate change, various educational links, and information on NRCAN sponsored contests. This website is appropriate for children 6-13 yrs old.

Atlas of Canada

<http://atlas.nrcan.gc.ca/site/english/index.html>

Atlas of Canada is about more than just maps! The website contains information on a variety of topics such as environment, economy, people and society, history, climate change, freshwater, and health. There is also a Learning Resources section containing information such as geographic facts about Canada, lesson plans and quizzes.

Parks Canada Teacher's Corner

http://www.pc.gc.ca/apprendre-learn/prof/itm3-guides/index_e.asp

Parks Canada Teacher's Corner has organised their learning resources into two sections – the Teacher Resource Centre and Teacher's Guides. There is also a Youth Adventure Zone that allows children to learn while playing ecology-themed games. The Teacher Resource Centre lists activities, fact sheets about parks, historic sites and ecozones, and lesson plans. The Teacher's Guides section contains an Eco-lessons section which links to lesson plans for grades 4-11 on a variety of environmental issues.

Canadian Space Agency Teacher's page

<http://www.space.gc.ca/asc/eng/educators/default.asp>

Studying Climate with Cloudsat: This learning resource demonstrates that science and technology can be used to investigate the natural and constructed world to seek solutions to practical problems. The Studying Climate with Cloudsat learning resource is targeted towards primary school students in grades four to six. The website contains both student resources and an educators guide.

Learning for a Sustainable Future (LSF)

<http://www.lsf-lst.ca/>

Founded in 1991 by a diverse group of youth, educators, business leaders, and government and community members, *Learning for a Sustainable Future* is a non-profit Canadian organization whose mission is to promote, through education, the knowledge, skills, perspectives, and practices essential to a sustainable future.

One of LSF's goals is to enhance the integration of Education for Sustainable Development (ESD) into all subject areas in K-12 classes across Canada. The goal of the Teaching for Change database is to facilitate this integration by providing teachers with effective teaching tools.

The LSF database is an online library where teachers can search for excellent, curriculum-matched ESD resources. Teachers can search by:

- Subject, grade, and province/territory
- ESD issue or keyword
- Language (English/French)