An abstract graphic design featuring several overlapping circles in various shades of light blue. A thin vertical line runs down the right side of the image. A horizontal line is positioned below the word 'Environment'.

Environment

Introduction

The publication in 1962 of Rachel Carson's book *Silent Spring* is often cited as the beginning of the environmental movement in North America and around the world. The book was a wake-up call regarding the potentially grave consequences of uncontrolled and widespread pesticide use, not only for animals but also for humans. A decade later, in 1972, the book *Limits to Growth* was published, which modelled the consequences of a rapidly growing world population and the extraction of finite natural resources. It has had a huge impact on how thought leaders and policy makers think about environmental issues. That same year, the United Nations hosted the Conference on the Human Environment in Stockholm, Sweden, to discuss the state of the global environment and to emphasize the need to protect renewable and non-renewable resources, as well as to make the link between resource depletion and poverty. Finally, the widely famous picture of the Earth from space was taken by the Apollo 17 spacecraft that year and quickly became a symbol for "spaceship Earth," our fragile and finite home floating in a sea of blackness. This image made it obvious that what we do to our environment, we ultimately do to ourselves.

As environmental concerns, such as air and water pollution and resource depletion, grew as a result of increasing economic activity and a growing human population, so did concerns about the anthropogenic effects on the natural environment in relation to other issues such as health and well-being, poverty, and social and economic development. To further explore these relationships, the United Nations convened the World Commission on Environment and Development (WCED) in 1983, which led to the publication of *Our Common Future*, a seminal report that recognized the global nature of environmental problems and the necessity to achieve sustainable development, defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." At the core of the report is the concept of "needs," particularly of the poor, for whom development must be a priority in order for them to have their needs met; there is also the concept of limitations imposed by technology and social organization.

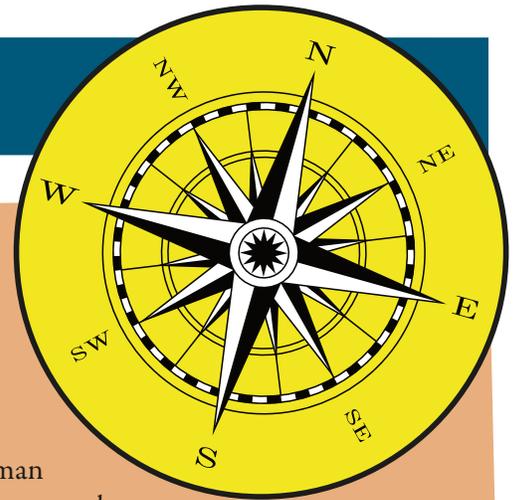
Our Common Future laid the groundwork for the 1992 Earth Summit, officially known as the UN Conference on Environment and Development, which led to the adoption of *Agenda 21*, a comprehensive blueprint for action to combat poverty and address the root causes of environmental degradation, including climate change, desertification, the loss of biodiversity, and the sound management of toxic chemicals and hazardous waste. *Agenda 21* acknowledges that poverty and environmental degradation are closely interrelated, and that "while poverty results in certain kinds of environmental stress, the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries, which is a matter of grave concern, aggravating poverty and imbalances" (Ch. 4.3). Highlighting these unsustainable patterns of consumption and production was important because it is a recognition that global climate change, increasing fresh water scarcity, the loss of biodiversity and animal habitat, the loss of productive agricultural land, the irreversible destruction of ecosystems, and the increasing amounts of waste and toxins emitted are symptoms of humanity's unsustainable economic activity. As such, environmental issues (impacts) can

only be addressed successfully over the longer term if the underlying patterns—including the behaviours and mindsets that give shape to these patterns—are addressed. The Earth Summit also led to the recognition of some key principles, including the precautionary principle (Principle 15): acting in such a way as to avoid serious or irreversible harm in the face of risks to health or the environment; and the principle of common but differentiated responsibilities (Principle 7): both rich and poor countries need to implement sustainable development, but the developed countries acknowledge the particular responsibility that they bear in light of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Ecological trends have gotten worse, not better, despite follow-up conferences and summits, including the UN Millennium Summit (2000) that led to the adoption of the Millennium Development Goals, which is a global action plan to achieve the eight anti-poverty goals by a 2015 target, and the UN World Summit on Sustainable Development (2002), which examined progress since the Rio Conference.

Humanity's unsustainable use of the planet's finite renewable and non-renewable resources and destruction of "sinks" has today created a state of ecological overshoot at the global scale, in a context where nearly a third of humanity still lives in poverty and has yet to benefit from the promises of development and economic growth. As the UN Millennium Ecosystem Assessment (2005) concludes, "Human activity is putting such strain on the natural functions of Earth that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted." The Ecological Footprint, a metric that was developed in Canada in the mid-1990s that allows us to calculate human pressure on the natural world, shows that if the entire world population were to live like the average Canadian, some three additional planets like Earth would be necessary to support these lifestyles.

The political challenge today is to implement the solutions necessary that are commensurate with the scale of the environmental problems humanity is facing, so that meeting the needs of the world's poor can be achieved within the ecological carrying capacity of Earth. One overarching barrier to meaningful change is overcoming the notion that the environment is "out there," separate from human beings and their economy, and that social and economic systems can exist independently from the environment. The trans-disciplinary field of ecological economics addresses the interdependence and co-evolution of human economic systems and natural systems, and frames the economy as a subsystem of the planetary ecological system. Such a lens underscores the importance of conserving natural resources, protecting ecosystems, and minimizing pollution, as this is the foundation of both human economic activity and of health and well-being.



Exploring the Issues

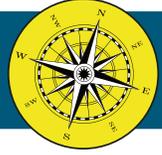
Healthy ecosystems, preservation of biodiversity; water management, quality; limited resources versus unlimited development/growth; responsible resource extraction; energy efficiency and alternative energy sources; environmental and human disasters (prevention, response, individual, and collective); environmental degradation and technological solutions; sustainable cities, design, urban planning; alternative transportation; standard of living versus quality of life; carrying capacity; energy consumption, carbon footprint, travel and transportation alternatives, alternative energy sources; stewardship and equitable sharing of natural resources; economic and environmental refugees; population increase, distribution, movement, migration, urbanization; politics and economics of climate change (e.g., impact of industrialization, responsibilities of developed/less-developed economies, Kyoto Accord; Arctic sovereignty); Gaia hypothesis, systems thinking, interconnectedness of human and natural systems, living sustainably, etc.

The environment: What is it? How does it function? What does it provide humans (and other species)?

- Ecosystem functioning and the importance of biodiversity
- The Gaia Hypothesis—Earth as a system
- Services provided by the environment—water, air, food, etc.
- Aesthetic, cultural, and spiritual values in nature
- Attitudes toward the environment—anthropocentrism versus “deep ecology” or other belief systems

Our impact on the environment: How do we affect our environment? ...in Canada? ... globally? What are our assumptions about our relationship with the environment?

- Drivers of resource use
- Impacts of economic growth, as well as overconsumption and under-consumption, on the environment
- Carbon footprints and ecological footprints
- Fossil fuel dependence, climate change—economics and politics preventing change
- Resource depletion—reliance and faith in technology, resource use in moderation
- Industrial agriculture



- Unsustainable consumption and production patterns and waste
- Population growth
- Disconnect between the environment and our daily lives, and between cultural and social perspectives on the environment and our lifestyles

Environmental Solutions and Moving Forward

- Low-carbon economy, reducing dependence on fossil fuels
- Sustainable cities and urban design
- Innovative, clean transportation
- Changing our production and consumption patterns, reducing waste throughout the product life cycle
- Renewable energies—solar, wind, geothermal, biofuels, and other alternatives
- Local food and organic, sustainable agriculture
- Traditional environmental knowledge
- Reconnecting to the environment and what it provides
- Ways of engaging on environmental issues with different actors/stakeholders like government, business, and civil society (including individuals, non-profit/non-governmental organizations, and Indigenous communities)



Essential Questions

Inquiry questions related to environment issues may include the following:

The environment: What is it? How does it function? What does it provide humans?

- How does the environment play a part in our daily lives?
- What does the environment provide us with?
- Where do our resources and energy come from?
- How is our economy linked to the environment?
- How does an ecosystem function? What happens when we disturb a system?
- How do we view our environment? What are our attitudes towards it? Does anyone "own" the environment?
- Does our understanding of the environment affect how we use it?

Our impact on the environment: How do we affect our environment? ...in Canada? ... globally? What are our assumptions about our relationship with the environment?

- How do our lifestyles affect our environment? How have our lifestyles and impacts on the environment changed over time?
- How might economic growth affect the environment? How might a growing global population affect the environment? How might technology affect the environment?
- What do we do in Canada that negatively affects our environment? How do our actions here affect the environment in other parts of the world?
- What is the relationship between wealth and environmental degradation? ...poverty and environmental degradation?
- What do you feel Canada's responsibilities are to other countries? What are our responsibilities in relation to stopping climate change?
- What environmentally destructive patterns are we "stuck" in, and why do we have trouble getting out of them? ...at home? ...in Canada? ...globally?



Environmental Solutions and Moving Forward

- How can we create a stronger understanding of the environment and its systems? How can we integrate knowledge of these systems into the way we live?
- What can we do personally do to protect the environment?
- What are some of the solutions we can implement now to prevent further environmental damage?
- Are new technologies a solution to our environmental problems?
- How do we talk about environmental issues? Who are the principal decision makers that can effect change?
- How should government, business, and citizens be working together to change the driving forces that create environmental problems?

DYK?

Did You Know?

"In the past 50 years, humans have consumed more resources than in all previous history."

– U.S. EPA (p. ii)

"Half the world's tropical and temperate forests are now gone."

– U.S. EPA (p. 5)

"75% of marine fisheries are now overfished or fished to capacity."

– U.S. EPA (p.5)

"Between 1950 and 2005, worldwide metals production grew sixfold, oil consumption eightfold, and natural gas consumption 14-fold. In total, 60 billion tons of resources are now extracted annually— about 50% more than just 30 years ago. Today, the average European uses 43 kilograms of resources daily, and the average American uses 88 kilograms."

– Worldwatch Institute (p. xxvi)

"Of all fresh water not locked up in ice caps or glaciers, some 20% is in areas too remote for humans to access and, of the remaining 80%, about three-quarters comes at the wrong time and place—in monsoons and floods—and is not always captured for use by people. The remainder is less than 0.08 of 1% of the total water on the planet. Expressed another way, if all of Earth's water were stored in a five-litre container, the available fresh water would not quite fill a teaspoon."

– Environment Canada

"In 2010, it was estimated that the human population used 150% of the resources generated by the Earth in one year."

– One Earth (p. 3)



Thought-Provoking Quotations

“Let every individual and institution now think and act as a responsible trustee of Earth, seeking choices in ecology, economics and ethics that will provide a sustainable future, eliminate pollution, poverty and violence, awaken the wonder of life and foster peaceful progress in the human adventure.”

– John McConnell

“Industrialized, chemical-intensive agriculture and our globalized system of distributing food and fibre are literally destroying the Earth, driving two billion farmers off the land, and producing a product which is increasingly contaminated. That’s why the wave of the future is organic and sustainable, not GMO.”

– Ronnie Cummins, (Eldridge et al.)

“We find ourselves ethically destitute just when, for the first time, we are faced with ultimacy, the irreversible closing down of the Earth’s functioning in its major life systems. Our ethical traditions know how to deal with suicide, homicide and even genocide, but these traditions collapse entirely when confronted with biocide, the killing of the life systems of the Earth, and geocide, the devastation of the Earth itself.”

– Father Thomas Berry

“Only when the last tree has been cut down,
Only when the last river has been poisoned,
Only when the last fish has been caught,
Only then will you find that money cannot be eaten.”

– Cree prophecy



“Climate change is a result of the greatest market failure the world has seen. The evidence on the seriousness of the risks from inaction or delayed action is now overwhelming. The problem of climate change involves a fundamental failure of markets: those who damage others by emitting greenhouse gases generally do not pay.”

– Nicholas Stern

“We’re in a giant car heading towards a brick wall and everyone’s arguing over where they’re going to sit.”

– David Suzuki (n.d.)

“This is where everything begins and ends—the natural world. You get out here and you see how everything hangs together. And you feel part of it—you feel in touch with something sacred.”

– David Suzuki (2007)

“One reason many world leaders have difficulty responding to the environmental crisis is that the worst of the predicted effects seems decades away [while] millions of people are suffering in poverty right now. These are urgent problems. How do we at the same time acknowledge and confront a problem that seems to lie in our future?”

– Al Gore

“In Indian Agriculture, women use up to 150 different species of plants (which the biotech industry would call weeds) as medicine, food, or fodder. For the poorest, this biodiversity is the most important resource for survival. . . . What is a weed for Monsanto is a medicinal plant or food for rural people.”

– Vandana Shiva

“All of humanity now has the option to ‘make it’ successfully and sustainably, by virtue of our having minds, discovering principles and being able to employ these principles to do more with less.”

– Buckminster Fuller



“The most important fact about Spaceship Earth: an instruction manual didn’t come with it.”
– Buckminster Fuller

“We are not going to be able to operate our Spaceship Earth successfully nor for much longer unless we see it as a whole spaceship and our fate as common. It has to be everybody or nobody.”
– Buckminster Fuller

“How can we make the world work for 100 percent of humanity in the shortest possible time through spontaneous cooperation without ecological damage or disadvantage to anyone?”
– Buckminster Fuller

“I learned very early and painfully that you have to decide at the outset whether you are trying to make money or to make sense, as they are mutually exclusive.”
– Buckminster Fuller

“The world will no longer be divided by the ideologies of left and right, but by those who accept ecological limits and those who don’t.”
– Wolfgang Sachs (Potter)

Business as usual, government as usual, and perhaps even protest as usual are not giving us the progress needed to achieve sustainable development. Let’s see if we can’t work together to find better paths forward.”
– Paul Hohnen, Royal Institute of International Affairs (Strauss)

“Change is disturbing when it is done to us, exhilarating when it is done by us.”
– Rosabeth Moss Kanter

“You don’t see something until you have the right metaphor to let you perceive it.”
– Thomas Kuhn



“Mother Nature doesn’t do bailouts... We have been getting rich by depleting all our natural stocks—water, hydrocarbons, forests, rivers, fish and arable land—and not by generating renewable flows...”

– Thomas Friedman

“The most critical task facing humanity today is the creation of a shared vision of a sustainable and desirable society, one that can provide permanent prosperity within the biophysical constraints of the real world in a way that is fair and equitable to all of humanity, to other species, and to future generations.”

– Robert Costanza

“In the end, enjoying life’s experiences is the only rational thing to do. You’re sitting on a planet spinning around in the middle of absolutely nowhere. Go ahead, take a look at reality.”

– Michael A. Singer

“The question of reaching sustainability is not about if we will have enough energy, enough food, or other tangible resources...The question is: will there be enough leaders in time?”

– Dr. Karl-Henrik Robèrt

“You have to think of environmental stress as kind of an underlying pressure, an almost tectonic stress within the society that increases the likelihood of violence but doesn’t necessarily cause it by itself. It has to come with other things such as weak governments, availability of weapons, and also deep ethnic cleavages within a society that can make violence more likely. And then all of a sudden, you get a dramatic outbreak of riots in the streets.”

– Thomas Homer-Dixon (Screenscope)

“The big issue on the planet is not just the fact that we’re going from 6.7 billion people today to 9.2 billion. It’s the number of people living an American lifestyle, eating American-sized Big Macs, living in American-sized houses, driving American-sized cars, on American-sized highways.”

– Thomas Friedman (Screenscope)



Making a Difference

Name	How they make a difference
The Worldwide Fund for Nature (WWF)	<p>“For more than 50 years, WWF has been protecting the future of nature. The world’s leading conservation organization, WWF works in 100 countries and is supported by close to 5 million members globally. WWF’s unique way of working combines global reach with a foundation in science, involves action at every level from local to global, and ensures the delivery of innovative solutions that meet the needs of both people and nature.”</p> <p>www.worldwildlife.org/who/index.htm</p>
Friends of the Earth International	<p>“FOEI is an extensive grassroots environmental network and campaigning on some of today’s most urgent environmental and social issues. They work to challenge the current model of economic and corporate globalization, and promote solutions that will help to create environmentally sustainable and socially just societies. Their work covers issues such as climate justice and energies, food security and agriculture, forests and biodiversity, mining and water issues.”</p> <p>www.foei.org/</p>
Greenpeace	<p>“Founded in Vancouver in 1971, Greenpeace today operates in more than 40 countries with headquarters in Amsterdam. They have more than 89,000 supporters in Canada and 2.9 million members worldwide. Greenpeace is an independent, campaigning organisation which uses non-violent, creative confrontation to expose global environmental problems, and to force the solutions which are essential to a green and peaceful future. Greenpeace’s goal is to ensure the ability of the earth to nurture life in all its diversity. Therefore Greenpeace seeks to protect biodiversity in all its forms; prevent pollution and abuse of the earth’s ocean, land, air and fresh water; end all nuclear threats and promote peace, global disarmament and non-violence.”</p> <p>www.youtube.com/watch?v=XLBDmhsDY3k www.greenpeace.org/canada</p>



<p>David Suzuki Foundation (and David himself)</p>	<p>“A Canadian organization founded by award-winning scientist, environmentalist, and broadcaster David Suzuki, the foundation works with government, business, and individuals to conserve our environment by providing science-based education, advocacy, and policy work, and acts as a catalyst for necessary social change. The foundation’s vision is that, within a generation, Canadians act on the understanding that we are all interconnected and interdependent with nature.”</p> <p>www.davidsuzuki.org/</p>
<p>International Institute for Sustainable Development</p>	<p>“The International Institute for Sustainable Development (IISD) is a Canadian-based, public policy research institute that has a long history of conducting cutting-edge research into sustainable development. IISD’s story began in 1988 when Prime Minister Brian Mulroney announced Canada’s plans to establish an international institute dedicated to advancing sustainable development at the United Nations. Through its head office in Winnipeg, Manitoba and its branches in Ottawa, Ontario; New York, NY; and Geneva, Switzerland IISD applies human ingenuity to help improve the well being of the world’s environment, economy, and society.”</p> <p>www.iisd.org/</p>
<p>350.org</p>	<p>“350.org is an international campaign that’s building a movement to unite the world around solutions to the climate crisis, with the help of actors, artists, athletes, businesses and others. Their mission is to inspire the world to rise to the challenge of the climate crisis—to create a new sense of urgency and of possibility for the planet. Their focus is on reaching 350 parts per million CO₂. If we can’t get below that, scientists say, the damage we’re already seeing from global warming will continue and accelerate. But 350 is more than a number—it’s a symbol of where we need to head as a planet.”</p> <p>www.350.org/en</p>
<p>TckTckTck</p>	<p>“The TckTckTck initiative is the face of the Global Campaign for Climate Action (GCCA), an unprecedented global alliance of more than 270 non-profit organizations all over the world. Their shared mission is to mobilize civil society and galvanize public support to ensure a safe climate future for people and nature, to promote the low-carbon transition of our economies, and to accelerate the adaptation efforts in communities already affected by climate change. Their website provides regular updates on climate change news, and activities that citizens can participate in to make a difference.”</p> <p>http://tcktcktck.org/</p>



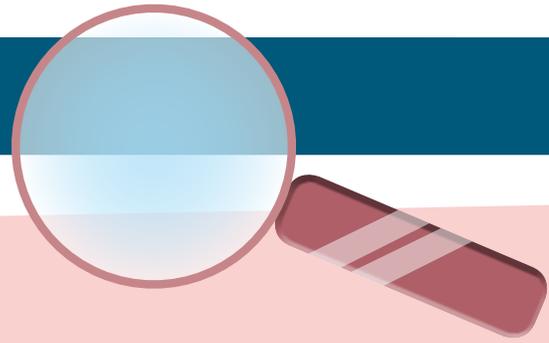
<p>Global Footprint Network</p>	<p>“The Global Footprint Network vision is a world where everyone can live well, within the means of one planet. Their programs are designed to influence decision makers at all levels of society and to create a critical mass of powerful institutions using the Ecological Footprint measurement to put an end to our overuse of the environment, and get our economies back into balance. Their Ten-in-Ten campaign is engaging national governments to establish the Ecological Footprint as a prominent, globally accepted metric as widespread as the GDP.”</p> <p>www.footprintnetwork.org/en/index.php/GFN/</p>
<p>Manitoba Eco-Network</p>	<p>“The Manitoba Eco-Network promotes positive environmental action by connecting people and groups in our communities. We educate, we facilitate, we celebrate! Manitoba Eco-Network is an umbrella for environmental non-governmental organizations (ENGO’s) throughout the province. We welcome individual, ENGO and associate members to our organization.</p> <p>We are a registered charitable organization, and a regional affiliate of the Canadian Environmental Network, based in Ottawa.”</p> <p>http://mbeconetwork.org/</p>
<p>Earth Day Canada</p>	<p>“Earth Day Canada (EDC) is a national environmental communications organization mandated to improve the state of the environment by empowering Canadians to achieve local solutions. Since 1991, EDC has been coordinating Earth Day/Earth Month events, and creating successful community programs and award-winning artistic and media projects. Earth Day’s mission is to improve the state of the environment by empowering and helping Canadians to take positive environmental action.”</p> <p>www.earthday.ca/pub/</p>
<p>World Environment Day</p>	<p>“World Environment Day (WED) is an annual event that is aimed at being the biggest and most widely celebrated global day for positive environmental action. WED activities take place all year round but climax on 5 June every year, involving everyone from everywhere. WED celebration began in 1972 and has grown to become the one of the main vehicles through which the UN stimulates worldwide awareness of the environment and encourages political attention and action.”</p> <p>www.unep.org/wed</p>



**Canadian
Society for
Ecological
Economics
(CANSEE)**

“CANSEE is the Canadian chapter of ISEE, the International Society for Ecological Economics. ISEE endeavours to facilitate understanding between economists and ecologists in pursuit of a vision of a sustainable future, through trans-disciplinary research and dialogue. We recognize that economies of communities, regions, and countries are imbedded in and dependent upon nature’s capacity to sustain ecological goods and services for present and future generations. The CANSEE mandate is to promote an understanding of this reality through research, education and practice, and to inform policy development and decision-making in government, communities, businesses and other organizations. We believe that a world governed and grounded in sustainability and ecological economic principles and practices will lead to a sustainable future, for the common good.”

www.cansee.org/



Glossary

Anthropogenic:

Something caused by humans (e.g. anthropogenic climate change is a change in climate induced by human actions).

Anthropocentrism:

“Making decisions or examining situations solely on the basis of their effect on human beings, to the exclusion of consideration of other living things.” (BC Ministry of Education)

Biodiversity:

“A large number and wide range of species of animals, plants, fungi, and microorganisms. Ecologically, wide biodiversity makes ecosystems stronger and more resilient to change.” (NRDC)

Biofuel:

“A fuel produced from dry organic matter or combustible oils produced by plants.” Examples of biofuel include alcohol (from fermented sugar), bio diesel from vegetable oil and wood. (WHO)

Carbon Footprint:

“A representation of the effect human activities have on the climate in terms of the total amount of greenhouse gases they produce (measured in units of carbon dioxide).” (ESD)

Carbon Sequestration:

The process of removing carbon from the atmosphere and depositing it in a reservoir.

Carrying Capacity:

“The total population an area is able to support given the quality of the natural environment and the prevailing technology available.” (ESD)

Climate Change:

“A regional change in temperature and weather patterns. Current science indicates a discernible link between climate change over the last century and human activity, specifically the burning of fossil fuels.” (NRDC)

Composting:

Biologically degrading materials such as leaves and manure to create a mixture of organic matter that is used to improve soil structure and provide nutrients.

Deforestation:

Cutting down trees to use the land as something other than a forest.

Ecosystem:

An interconnected and symbiotic grouping of animals, plants, fungi, and microorganisms.

Fossil Fuel:

“A fuel, such as coal, oil, and natural gas, produced by the decomposition of ancient (fossilized) plants and animals.” (NRDC)



Greenhouse Gases:

“Gases present in the atmosphere that trap heat from the sun and warm the earth. Such gases include carbon dioxide, methane, water vapour, nitrous oxide, ozone and halocarbons.” (ESD)

Ecological Footprint:

“The area of land and water required to support a defined economy or human population at a specified standard of living indefinitely, using prevailing technology.” (ESD)

Food miles:

“The number of miles food produce travels from ‘plough to plate’, that is from the place of production to consumption.” (ESD)

Industrial agriculture:

“A type of modern farming that refers to the industrialized production of livestock, poultry, fish and crops.” (NRDC)

Life Cycle Assessment:

“A way of measuring a product’s full environmental costs, from raw material to final disposal.” (NRDC)

Natural Capital:

“Natural capital can be defined as all of the raw materials and natural cycles on Earth.” (ESD)

Non-Renewable Resource:

“A resource that is not replaced or only replaced very slowly by natural processes. Examples are precious metals.” (ESD)

Recycling:

“The series of activities, including collection, separation, and processing, by which materials are recovered from the waste stream for use as raw materials in the manufacture of new products.” (EPA)

Renewable Energy:

“Energy resources such as windpower and solar energy that can keep producing indefinitely without being depleted.” (NRDC)

Renewable Resource:

“A resource that can be replenished at a rate equal to or greater than its rate of depletion. Examples of renewable resources include solar energy, trees, and soy-based products.” (NRDCP)

Sustainable Development:

Has been defined as ‘Development which meets the needs of the present without compromising the ability of future generations to meet their own needs’. (“Our Common Future,” Report of World Commission on Environment and Development, commonly called the The Brundtland Report). It is a type of development that must account for not only economic benefits, but also environmental and social ones.

Monocropping:

The practice of growing the same crop on the same land year after year.

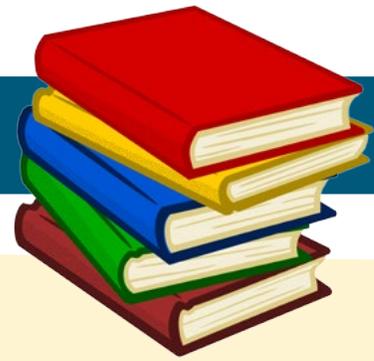


Tar Sands:

“A type of unconventional petroleum deposit found in large quantities in Canada and Venezuela consisting of a mixture of sand, water, clay, and an extremely viscous form of petroleum.” (ESD)

Traditional Ecological Knowledge (TEK):

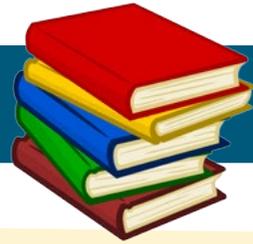
“TEK is place-based knowledge of a particular ecosystem, developed by the people who have been living in it - this includes knowledge of plant uses, system resilience, etc.” (ESD)



Resources

Print

- Battiste, Marie. and James (Sa'ke'j) Youngblood Henderson. *Protecting Indigenous Knowledge and Heritage: A Global Challenge*. Saskatoon, SK: Purich Publishing Ltd, 2000.
- Berkes, Fikret. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Abingdon, UK: Taylor & Francis, 1999.
- Berry, Wendell. *Bringing it to the Table*. Berkeley, CA: Counterpoint, 2009.
- Capra, Fritjof. *The Web of Life*. New York, NY: Anchor Books, 1997.
- Carson, Rachel. *Silent Spring*. New York, NY: Mariner Books, 2002.
- Cronon, William (ed.). *Uncommon Ground: Toward Reinventing Nature*. New York, NY: W.W. Norton and Company, 1995.
- Hawken, Paul, Amory Lovins, and L. Hunter Lovins. *Natural Capitalism: Creating the Next Industrial Revolution*. New York, NY: Back Bay Books, 2008.
- Heinberg, Richard. *Peak Everything: Waking Up to the Century of Declines*. Gabriola Island, BC: New Society Publishers, 2010.
- Johannes, Robert E. (ed.) *Traditional Ecological Knowledge: A Collection of Essays*. Gland, Switzerland: International Union for the Conservation of Nature, 1978.
- Kingsolver, Barbara. *Animal, Vegetable, Miracle*. New York, NY: Harper Perennial, 2008.
- Lovelock, James. *Healing Gaia*. New York, NY: Harmony Books, 1991.
- McKibben, Bill. *Earth: Making a Life on a Tough New Planet*. New York, NY: St. Martin's Griffin, 2011.
- _____. *The End of Nature*. New York, NY: Random House, 2006.
- Meadows, Donnella H., Dennis L. Meadows, and Jørgen Randers. *Limits to Growth: The 30-Year Update*. White River Junction, VT: Chelsea Green, 2004.
- Patton, Michael, Frances Westley, and Brenda Zimmerman. *Getting to Maybe: How the World Is Changed*. Toronto, ON: Vintage Canada, 2007.
- Rees, William, Mathis Wackernagel, and Phil Testemale. *Our Ecological Footprint: Reducing Human Impact on the Earth*. Gabriola Island, BC: New Society Publishers, 1998.



- Roberts, Paul. *The End of Oil: On the Edge of a Perilous New World*. New York, NY: Mariner Books, 2005.
- Schumacher, E.F. *Small is Beautiful: Economics As If People Mattered*. New York, NY: Harper Perennial, 2010.
- Strong, Maurice. *Where on Earth are We Going?* New York, NY: Texere, 2001.
- Suzuki, David, and David R. Taylor. *The Big Picture: Reflections on Science, Humanity, and a Quickly Changing Planet*. Vancouver, BC: Greystone Books, 2009.
- Suzuki, David. *The Sacred Balance: Rediscovering our Place in Nature*. Vancouver, BC: Greystone Books, 2007.
- Von Weizsacker, Ernst, Charlie K. Hargroves, Michael H. Smith, Cheryl Desha, and Peter Stasinopoulos. *Factor Five: Transforming the Global Economy Through 80% Improvements in Resource Productivity*. London, UK: Earthscan, 2010.
- Wilson, Edward O. *The Future of Life*. New York, NY: Vintage, 2003.

Websites

Worldwatch Institute State of the World Reports (updated annually)

“Through research and outreach that inspire action, the Worldwatch Institute works to accelerate the transition to a sustainable world that meets human needs.”

www.worldwatch.org/bookstore/state-of-the-world

Center for Ecoliteracy

The Center for Ecoliteracy “leads systems change initiatives, publishes original books and resources, facilitates conferences and professional development, and provides strategic consulting.”

<https://www.ecoliteracy.org/>

The Solutions Journal (print and online)

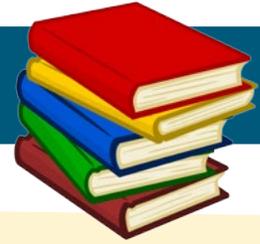
“*Solutions* is a non-profit print and online publication devoted to showcasing bold and innovative ideas for solving the world’s integrated ecological, social, and economic problems.”

www.thesolutionsjournal.com/

YES! Magazine – Powerful Ideas, Practical Actions (print and online)

“YES! Magazine reframes the biggest problems of our time in terms of their solutions.” It provides in-depth analysis, tools for citizen engagement, and stories about real people working for a better world.

www.yesmagazine.org/



Green Teacher Magazine

“*Green Teacher* magazine offers perspectives on the role of education in creating a sustainable future, practical articles and ready-to-use activities for various age levels, and reviews of dozens of new educational resources.”

www.greenteacher.com/

Worldchanging.com

An online magazine covering tools, models, and ideas for building a better future.

www.worldchanging.com/

The Indigenous Environmental Network

The Indigenous Environmental Network was established to educate and empower Indigenous Peoples to address and develop strategies to protect the environment, re-affirm traditional knowledge, and build healthy sustaining Indigenous communities.

www.ienearth.org/home/

Sustainable Table: Serving Up Healthy Food Choices

“Sustainable Table celebrates local, sustainable food, educates consumers about the benefits of sustainable agriculture and works to build community through food.”

www.sustainabletable.org/home.php

WWF’s Living Planet Report

WWF’s annual *Living Planet Report* shows the scale of the environmental challenges our planet faces and tells you what you can do about it.

http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/

Curriculum

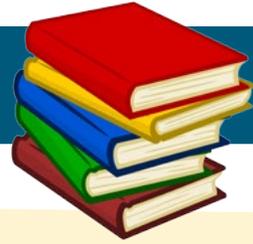
Learning for a Sustainable Future

“Founded in 1991 by a diverse group of youth, educators, business leaders, government and community members, LSF is a non-profit Canadian organization that was created to integrate sustainability education into Canada’s education system. LSF believes in socially, environmentally and economically sustainable society, with engaged citizens who think and act responsibly, today, and for generations to come. LSF’s mission is to promote, through education, the knowledge, skills, values, perspectives, and practices essential to a sustainable future.”

<http://www.lsf-1st.ca/>

UNESCO’s Teaching and Learning for a Sustainable Future

“Teaching and Learning for a Sustainable Future demonstrates the principles of effective teaching and learning that are a necessary part of reorienting education towards a sustainable future. That is, the type of professional development experiences in *Teaching and Learning for a Sustainable Future* seeks to ensure that the ‘medium’



for learning is a part of the ‘message’. In order to achieve this goal, the learning experiences in *Teaching and Learning for a Sustainable Future* reflect three principles of effective professional development: academic rigour, experiential learning and reflection.”

www.unesco.org/education/tlsf/

GreenLearning Canada

“GreenLearning creates free online education programs about energy and sustainability that engage and empower students to create positive change for our evolving world.”

www.greenlearning.ca

Teachers’ Guide to High Quality Educational Materials on Climate Change and Global Warming

“This guide points K–12 educators to the best sites for teaching about climate change: several that offer first rate background material, and others that include detailed lesson plans and experiments.”

www.hdgc.epp.cmu.edu/teachersguide/teachersguide.htm

The Environment and Resource Management

Province of Ontario. “The Environment and Resource Management, Grade 12: University/College Preparation.” *The Ontario Curriculum, Grades 11 and 12: Canadian and World Studies*. Toronto, ON: Province of Ontario, 2015. 227–245. Available online at www.edu.gov.on.ca/eng/curriculum/secondary/2015cws11and12.pdf

Ontario Ministry of the Environment E-Zone

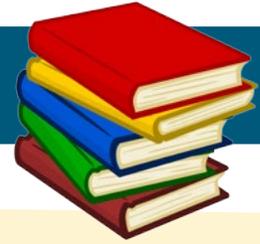
“Resources for teachers and parents to teach children about the little actions they can take to help protect the environment.”

<https://www.ontario.ca/page/e-zone>

Toward a Sustainable Agriculture

“The curriculum consists of five modules:

- Introduction to Sustainable Agriculture
- Corn, Beans, and Burgers: field crops in sustainable agriculture
- Flesh, Fish, and Fowl: animals in sustainable agriculture
- Apples, Beets, and Zinnias: sustainable horticulture
- A Growing Market: organic agriculture



Educators are welcome to adapt and reproduce sections of the curriculum for non-commercial use.”

www.cias.wisc.edu/curriculum/

Greening Schools

No longer actively funded, “Greening Schools was a joint effort of the Illinois Environmental Protection Agency (IL EPA) and the Illinois Waste Management and Research Center (WMRC). The purpose of the project was to help schools provide a safe and healthy environment. The project was also designed to provide teachers with standards-based tools to introduce the concepts of waste reduction and pollution prevention to students.”

http://greeningschools.org/resources/view_cat_teacher.cfm?id=133

North American Association for Environmental Education

‘Ecology lesson plans designed for high school, middle school, and elementary school science teachers are downloadable here.’

<https://naace.org/cepro/resources/ecology-lesson-plans>

Oxfam UK

“Oxfam Education offers a huge range of ideas, resources and support for developing global learning in the classroom and the whole school. All of the resources here support Education for Global Citizenship – education that helps pupils understand their world and make a positive difference in it.”

www.oxfam.org.uk/education

Environment Canada – EC Educator Resources - Provides access to featured lesson plans and links (divided for ages 6-12 and ages 13-18) -

<http://www.on.ec.gc.ca/community/youth/ec-educators-e.html>

Includes lesson plans and info about free educational programming that may take place in your area –

www.ec.gc.ca/education/default.asp?lang=En&n=D3D10112-1

Films and Videos

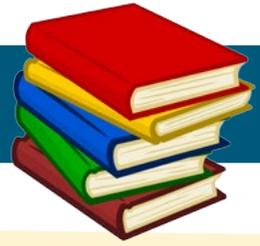
What is Ecological Literacy?

This film provides a brief definition of ecoliteracy by David Orr.

<https://www.youtube.com/watch?v=0tK6jogRMaY>

Free Documentaries: The Truth is Free

“Freedocumentaries.org streams full-length documentary films free of charge, with no registration needed. For several films, we even offer the ability to watch trailers or to download the actual film.



The films are gathered by our researchers as we scour the web for well-produced videos and present them to our viewers. We adhere to all copyright laws and honor the wishes of the producers.”

<https://freedocumentaries.org/>

The Ultimate Roller Coaster Ride: A Brief History of Fossil Fuels

“Fossil fuels have powered human growth and ingenuity for centuries. Now that we’re reaching the end of cheap and abundant oil and coal supplies, we’re in for an exciting ride. While there’s a real risk that we’ll fall off a cliff, there’s still time to control our transition to a post-carbon future.”

www.postcarbon.org/the-ultimate-roller-coaster-ride-a-brief-history-of-fossil-fuels/

Flow: For the Love of Water

“Irena Salina’s award-winning documentary investigation into what experts label the most important political and environmental issue of the 21st Century—The World Water Crisis. Salina builds a case against the growing privatization of the world’s dwindling fresh water supply with an unflinching focus on politics, pollution, human rights, and the emergence of a domineering world water cartel.”

www.flowthefilm.com

Hoot

“A young man moves from Montana to Florida with his family, where he’s compelled to engage in a fight to protect a population of endangered owls.”

www.imdb.com/title/tt0453494/

An Inconvenient Truth

“Director Davis Guggenheim eloquently weaves the science of global warming with Al Gore’s personal history and lifelong commitment to reversing the effects of global climate change in the most talked-about documentary at Sundance. An audience and critical favorite, *An Inconvenient Truth* makes the compelling case that global warming is real, man-made, and its effects will be cataclysmic if we don’t act now.”

<https://www.youtube.com/watch?v=8ZUoYGAI5i0>

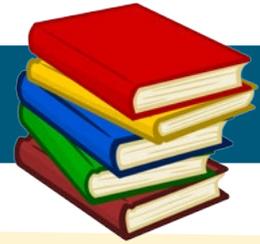
Darwin’s Nightmare

“Darwin’s Nightmare is a tale about humans between the North and the South, about globalization, and about fish.”

www.darwinsnightmare.com/

The 11th Hour

“With contributions from over 50 politicians, scientists, and environmental activists, including former Soviet leader Mikhail Gorbachev, physicist Stephen Hawking, Nobel Prize winner Wangari Maathai, and journalist Armand Betscher, the film documents the grave problems facing the planet’s life systems. Global warming, deforestation,



mass species extinction, and depletion of the oceans' habitats are all addressed. The film's premise is that the future of humanity is in jeopardy."

<https://freedocumentaries.org/documentary/the-11th-hour>

Food Inc.

"*Food, Inc.* unveils some of the sombre practices underpinning the American food industry, exploring how corporations place profits before consumer health, worker safety and the environment. This documentary argues that industrial production methods are not only inhumane, but they are also unsustainable from an economic and environmental standpoint."

<http://documentary-movie.com/food-inc/>

Fuel

"Director Josh Tickell takes us along for his 11-year journey around the world to find solutions to America's addiction to oil. A shrinking economy, a failing auto industry, rampant unemployment, an out-of-control national debt, and an insatiable demand for energy weigh heavily on all of us. Fuel shows us the way out of the mess we're in by explaining how to replace every drop of oil we now use, while creating green jobs and keeping our money here at home. The film never dwells on the negative, but instead shows us the easy solutions already within our reach."

<https://www.youtube.com/watch?v=GVBmWIGupxQ>

A Farm for the Future

Wildlife filmmaker Rebecca Hosking investigates how to transform her family's farm in Devon into a low-energy farm for the future and discovers that nature holds the key.

<https://www.youtube.com/watch?v=3Lf9wJ4vWHc>

Ah...the Money, the Money, the Money (AKA The Battle for Salt Spring Island)

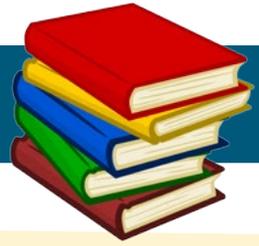
"This movie is about a logging war on Salt Spring Island. Salt Spring is a paradise located in British Columbia. The island attracts many people who want to get away from the Rat Race but are forced to deal with a company that now is logging the island where they live."

<https://www.youtube.com/watch?v=IOrCr79ha7Y>

Champions of the Land

"Documentary look at the growth of the United States' environmental conservation movement, focusing on such pioneers as John Muir, Aldo Leopold, Bob Marshall, Rosalee Edge and Rachel Carson." Documentary look at the growth of the United States' environmental conservation movement, focusing on such pioneers as John Muir, Aldo Leopold, Bob Marshall, Rosalee Edge and Rachel Carson.

<https://www.youtube.com/watch?v=-OyS6VQ4EGY>



Natural Connections

“This outstanding program makes effective use of interviews with well-spoken scientists, beautiful photography, top quality graphics, and original music to underline the importance of maintaining biodiversity, if we as a species want to survive and thrive on our home planet.”

www.bullfrogfilms.com/catalog/natcon.html

Sustainable Development and the Ecosystem Approach

“Two short but informative presentations: “Sustainable Development” (7 min. 42 sec.) lays out the concept of sustainable development in clear terms. It shows how sustainable development is more than just jargon, and relates the concept to the work of the World Resources Institute and Environment Canada’s State of the Environment Reporting organization. “Earth’s Harmony” (9 min. 38 sec.) shows how humans have become great agents of environmental change and have influenced ecosystems from the global to the microscopic. It urges us to modify our theories and to begin thinking in terms of ecosystems. Then we begin to see ourselves as part of Earth’s ecology... not apart from it.”

<http://www.landstewardship.org/resources/resource/378/>

Race to Save the Planet

“Race To Save The Planet is a 1990 TV series that aims to educate viewers on how to protect the environment. Its 10 episodes discuss environmental issues like the effect of the Industrial Revolution to the environment, extent of environmental destruction around the world, biodiversity loss, waste management, energy conservation, use of renewable resources, recycling, and improvement of existing environmental policies. The series was shown on Channel 2 Boston (WGBH) and featured Roy Scheider as narrator and Meryl Streep as hostess.”

<https://www.youtube.com/watch?v=6t7fH6o-Tq8>

Other Suggestions

Water Footprint Calculator

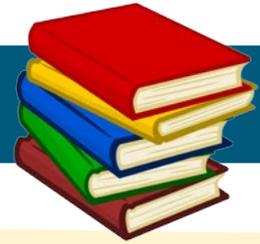
This calculator helps you estimate your personal water usage.

<http://www.watercalculator.org/>

Footprint Calculator

This calculator, provided by the Global Footprint Network, helps students determine how many planets are required to sustain their lifestyle.

<http://www.footprintnetwork.org/resources/footprint-calculator/>



Canon Envirothon

An annual competition held for high school students throughout North America. Designed as a way to teach teens about environmental education, the best teams from over 47 states compete in five subjects: Wildlife, Forestry, Soil, Aquatics, and Current Environmental Issues. Winners receive college scholarships.

www.envirothon.org/

The International Education and Resource Network (IEARN)

IEARN enables young people to undertake projects designed to make a meaningful contribution to the health and welfare of the planet and its people.

www.iearn.org/

Earth Force

Young people changing their communities and caring for our environment now, while developing life-long habits of active citizenship and environmental stewardship.

www.earthforce.org/

The Sierra Youth Coalition

An organization run by youth for youth, serving as the youth arm of the Sierra Club of Canada. Their mission is to empower young people to become active community leaders who contribute to making Canada a better society.

www.syc-cjs.org/

An Inconvenient Sequel: Truth to Power

“A decade after *An Inconvenient Truth* brought climate change into the heart of popular culture comes the follow-up that shows just how close we are to a real energy revolution.”

www.imdb.com/title/tt6322922/?ref_=nv_sr_1

Food Choices

“This documentary follows filmmaker Michal Siewierski as he explores the impact that food choice has on people’s health, the health of our planet and on the lives of other species.”

www.imdb.com/title/tt6039284/?ref_=tt_rec_tti

References

- Berry, Thomas. *The Great Work: Our Way into the Future*. New York, NY: Crown/Archetype, 2011. 104.
- British Columbia Ministry of Education. *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers*. Victoria, BC: Province of British Columbia, n.d.
- _____. *Sustainability Course Content: A Curriculum Framework*. Victoria, BC: Province of British Columbia, n.d.
- Costanza, Robert, and Ida Kubiszewski. *Creating a Sustainable and Desirable Future: Insights from 45 Global Thought Leaders*. Singapore: World Scientific Publishing, 2014. 33.
- Education for Sustainable Development (ESD). “Glossary of Terms.” *Education for Sustainable Development*. n.d. www.esd.rgs.org/link10.html (date accessed—2017-05-30).
- Environment Canada. *Shuswap Watershed Project Powerpoint*. Ottawa, ON: Environment Canada, 2004. Available online at www.shuswapwatershed.ca/teacherguide/B-Learning%20Resources/env.%20canada%20primer.pdf
- Friedman, Thomas L. “The Inflection is Near?” New York, NY: *New York Times*, 7 March 2009: WK12. Available online at <http://www.nytimes.com/2009/03/08/opinion/08friedman.html>
- Fuller, R. Buckminster. *C.J. Fearnley’s Favorite Quotes and Poems*. n.d. www.cjfeanley.com/cgi-bin/cjf-fortunes.pl?srchstr=Fuller&name=Submit (date accessed—2017-05-31).
- Fuller, R. Buckminster. *And It Came to Pass — Not to Stay*. Baden, Switzerland: Lars Müller Publishers, 2008. 7.
- Gore, Al. *Earth in the Balance: Forging a New Common Purpose*. New York, NY: Routledge, 2013. 46.
- Kuhn, Thomas S. *The Structure of Scientific Revolutions*, 2nd Edition. Chicago, IL: The University of Chicago Press, 1970. 48.
- Lynne Eldridge, Lynne Stoesz-Eldridge, and David Borgeson. *Avoiding Cancer One Day at a Time: Practical Advice for Preventing Cancer*. Edina, MN: Beaver’s Pond Press, 2006. 156.

- McConnell, John. *Earth's Resurrection*. n.d. www.earthsite.org/EarthResurrection.htm (date accessed—2017-05-30).
- Moss Kanter, Rosabeth. *The Change Masters: Corporate Entrepreneurs at Work*. London, UK: Unwin Hyman, 1983). 64.
- One Earth. *Background Paper #1: Sustainable Consumption & Production*. Vancouver, BC: One Earth Initiative Society, 2011.
- Robèrt, Karl-Henrik. *The Natural Step: Canada's Sustainability Learning Partnership Opportunity*. n.d. www.naturalstep.ca/sites/default/files/sustainability_learning_partnership_opportunity.pdf (date accessed—2017-05-31).
- Screenscope. *Journey to Planet Earth: Hosted and Narrated by Matt Damon*. Washington, DC: Screenscope, 2011. 3. Available online at www.screenscope.com/program_details/12-Plan-B-details.pdf
- Shiva, Vandana. *Stolen Harvest: The Hijacking of the Global Food Supply*. Lexington, KY: University Press of Kentucky, 2016. 104.
- Singer, Michael A. *The Untethered Soul*. Oakland, CA: New Harbinger Publications, 2007. 231.
- Stern, Nicholas. *Stern Review: The Economics of Climate Change*. London, UK: Government of the United Kingdom, 2006. viii. Available online at http://mudancasclimaticas.cptec.inpe.br/~rmclima/pdfs/destaques/sternreview_report_complete.pdf
- Strauss, Michael. *How to Lobby at Intergovernmental Meetings*. London, UK: Earthscan, 2004. 10.
- Suzuki, David. "Quotes on Climate Change." *Climate Change Guide*. n.d. www.climate-change-guide.com/quotes-on-climate-change.html#david-suzuki (date accessed—2017-05-30).
- _____. *Sacred Balance: Rediscovering Our Place in Nature*. Vancouver, BC: Greystone Books, 2007.
- United States Environmental Protection Agency (EPA). *Measuring Recycling: A Guide for State and Local Governments*. Washington, DC: EPA, 1997. 54.
- _____. *Sustainable Materials Management: The Road Ahead*. Washington, DC: EPA, 2009.

World Health Organization (WHO). *Climate Change and Human Health: Risks and Responses*. Eds. A.J. McMichael, D.H. Campbell-Lendrum, C.F. Corvalan, K.L. Ebi, A.K. Githeko, J.D. Scheraga, and A. Woodward. Geneva, Switzerland: WHO, 2003. 286.

Worldwatch Institute. *State of the World 2010: Transforming Cultures From Consumerism to Sustainability*. Washington, DC: Island Press, 2015.