Canadian Environment Week

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Its all a Matter of Knowing Our Ecological Footprints

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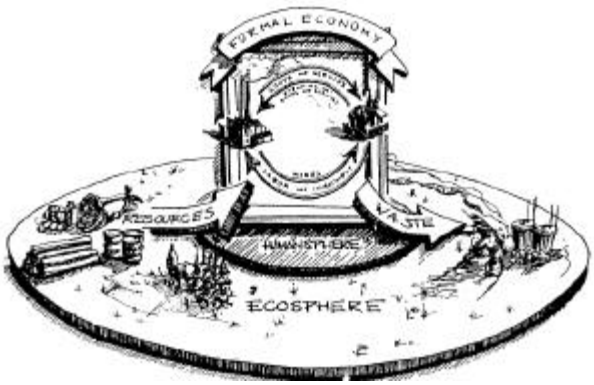
What is Canadian Environment Week?

Canadian Environment Week is held the first week of June each year to coincide with World Environment Day, proclaimed by the United Nations in 1972 and celebrated on June 5. It was established through a Private Member's Bill introduced by British Columbia MP Tom Goode and given Royal Assent in March of 1971. The name "Canadian Environment Week" was chosen to bring attention to Canadians of our personal and economic dependence and interdependence on a healthy, sustaining, natural environment.

Many businesses and schools in Canada take part in an Environment Week activity. We do this to provide an opportunity to raise awareness for the need to live within the capacity of nature to sustain us; to encourage the community and our leaders to act responsibly by considering the full environmental implications of their decisions; and to involve the community in actions which raise awareness that we and our economic system depend on living within the productive capacity of nature. Living within the capacity of nature to sustain us is what sustainable development is about.

So How Sustainable Are We?

On a larger scale human economies are all built upon the free use of natures' services. No matter how sophisticated our technology the production/consumption process requires land and water based ecosystems services. We are wholly dependant on nature to supply all the resources we use. More importantly nature also recycles all of our wastes. When we produce more waste than nature can assimilate the waste accumulates in the form of polluted air, land and water. We don't need our science to tell us that these things are already part of our experience, we can see for ourselves what happens when human activity overloads the capacity of our airsheds to absorb smog or our groundwater to assimilate animal wastes and chemical pollutants.



Nature's services are a "natural capital" used by human economy to create human capital or money. Availability and use of natural capital is the basis for growth and development of our economic system. Living within the capacity of nature to sustain us is the basis of sustainable development issues.

Graphic by Phil Testamale in Our Ecological Footprint - Mathis Wackernagel and William Rees, 1996

Living sustainably is nothing new for most of us. In fact it is something we are all familiar with when it comes to our personal finances. We work to make money, sometimes we take out loans but in every case we balance how much we spend with how much we make. The most essential information for us is: how much money do we make, how much do we have and how much do we spend? With this information we regulate our lives and our activities within our economic means. Those that don't regulate themselves end up accumulating debt until the burden to creditors becomes untenable and bad things begin to happen.

The same basic accounting principles apply to the natural capital we use to sustain ourselves. For nearly a million years our species has operated well within the surplus of natural systems to sustain us and there was no reason to measure our use of natural capital. Over the last 300 years our numbers have grown dramatically and our use of energy and technology have made us a significant force within nature. Our need to account for the natural capital we use is now a survival issue.

Viewed from space by NOAA 12 the Earth does not readily show the influence of our society until darkness falls. The darkness punctuated by lights of the cities of the northeast.

Photo courtesy of NOAA

Because people consume the products and services of nature, every one of us has an impact on our planet. This is not problematic as long as the human load stays within the ecological capacity of the biosphere. But does it?

The "ecological footprint" concept (Rees 1996, Wackernagel and Rees 1996) helps to answer this question and estimate people's impact. It does this by measuring how much nature people use today to sustain themselves. Ecological footprint calculations are based on two simple

facts: first, we can keep track of most of the resources we consume and many of the wastes we generate; secondly, most of these resource and waste flows can be measured as a corresponding area of biological productivity. Thus, the ecological footprint of any defined population from a single individual to a whole city or country is expressed as the area of biologically productive land and water required exclusively to produce the resources consumed and to assimilate the wastes generated by that population, using prevailing technology. As people use resources from all over the world and affect far away places with their wastes, footprints sum up the extent of these ecological areas wherever they may be located on the planet. The ecological footprint measures how much nature (natural capital) is consumed to sustain us. The Ecological Footprint compares a population's demands with nature's capacity to sustain it.

Recent updates of global and national footprints (Wackernagel et al., 1999, Wackernagel et al., 2000) show that on our Earth there are only **2.2** hectares of biologically productive land available per person to provide all the resources, waste assimilation and life support services we need to live.

	THE ECOLOGICAL FOOTPRINTS OF NATIONS, WWF PROJECT (1996 data)			
			eco-footprint	
			(without bio-	existing
		population	diversity resp.)	biol. capacity
		(in 1996)	in [ha/cap]	in [ha/cap]
	WORLD	5,744,872,000	2.8	2.2
1	United Arab Emirates	2,260,000	16.0	0.7
2	Singapore	3,375,000	12.3	0.1
3	United States of America	269,439,000	12.3	5.6
4	Denmark	5,241,000	10.5	5.7
5	Kuwait	1,686,000	10.3	0.6
6	New Zealand	3,720,000	9.6	15.9
7	Ireland	3,634,000	9.5	6.7
8	Australia	18,141,000	8.5	9.4
9	Finland	5,126,000	8.4	9.8
10	Canada	29,947,000	7.7	11.2
11	Sweden	8,832,000	7.5	8.0
12	France	58,251,000	7.3	4.3
13	Hong Kong	6,363,000	7.1	0.1
14	Estonia	1,466,000	7.1	4.0
15	Switzerland	7,198,000	6.6	2.3
16	Czech Republic	10,316,000	6.3	2.9
17	Germany	81,909,000	6.3	2.5
18	United Kingdom	58,431,000	6.3	1.8
19	Norway	4,372,000	6.1	6.2
20	Saudi Arabia	18,829,000	6.1	0.4

The average Canadian uses over **7.7** hectares to sustain his or her current levels of consumption and this number continues to increase over time. In 2020 the Canadian footprint is projected grow to near **11.3** hectares (2/3 of which will be the result of our growing demand for fossil energy). Over the same period the available capacity per person will further decline as global population increases. As a nation we are consuming more than four times more natural capital than is globally sustainable. We are the tenth most consumptive nation on the planet consuming 3.8 times more than our equitable share of

natural capital. As a result we represent a much greater load per capita on the Earth's ecosystems than other nations. We are not currently sustainable and we are moving further away from it. The outcome of this will lead to greater difficulties for all of us in the future.

In Canada our demands for energy, resources and waste assimilation are among the highest in the world. Our ecological footprints are more than four times larger than our equitable share. If everyone on Earth consumed at the Canadian level we would need more than 4 planets the size of Earth to provide all the services from nature we need to sustain us. Today we know that our footprints continue to grow. Growing footprints means we are moving away from sustainability. But we don't need footprints to tell us. We can already see and feel the effects of climate change, ozone depletion and the decline in biodiversity**.** Our challenge is to find a way to balance human consumption and nature's limited productivity in order to ensure that our communities are sustainable today- locally, regionally and globally. In the long term, we won't have a choice about whether to do this or not, but right now, we can still chose how we do it. Many people concerned with these issues believe that choosing wisely now will give us the time we need to make our businesses and communities more sustainable for our children, and at the same time improve our quality of life.

The negative messages which seem to characterize the practice of modern environmentalism have not succeeded in inspiring change in our society. Amid the confusion and noise generated by thousands of issues, the attention of civil society has been fragmented to the point that there is no sense of what direction we need to be moving towards. It is a piecemeal approach and does not lead people towards clear directions or solutions. The larger dynamic of a growing population and increasing consumption and its correlation to waste and increased ecological load is ignored by both environmentalist and policymakers. Instead there exists a functional fixation on effects rather than cause. It creates a

constant diversion of political and social attention from one issue to the next in an endless procession of issues that grow hot and cold with the seasons and each recurring incident.

We need and must celebrate special days like Environment Week and Earth Day, but it must become more than just planting trees, cleaning up and saying a few nice words about the Earth and protecting the environment. The Earth is showing clear signs that something is really wrong. These special days must carry the message that we are exceeding the limits of the Earth and that we must start living sustainably today- globally, regionally and locally. Sustainability is about planning to be around in the future. It is also about having a vision, a sense of direction and an appropriate sense of urgency and acting today before a future we may not like or want, gets here. The Earth is our life support system and the basis of our economy. It provides us with natural capital that is critical to our well being. This natural capital is at risk of being lost or permanently devalued. Once it is gone there is no getting it back - as the saying goes extinction is forever!

In spite of 2 global conferences on environment and five climate change summits, the warnings from the Union of Concerned Scientists, the statement on climate change made by 2,500 international economists calling for global action, we are falling further behind. The growing evidence of accelerating biodiversity loss, climate change, ozone depletion, collapse of fisheries stocks, increasing old growth forest loss, growing air and water quality problems and population growth does little to raise an appropriate sense of urgency for the risks we face in the future. For the most part it is still business as usual. We react to incidents rather than root causes and when we become desensitized to them we begin to believe they are fixed we forget about them. There is little sense of urgency and even less support from our leaders and business on making changes to make sustainability a viable basis for future development. Contrast to this is the manner in which global resources were mobilized to deal with the "virtual" global Y2K crisis. In three years the businesses and governments created the needed sense of urgency, mobilized people and over 1.2 trillion dollars to deal with it. The same effort has yet to be seen in dealing with the environmental crisis we face.

Some Perspectives Closer to Home

People who live in the province of Ontario are among the highest per capita consumers of energy on the planet. Energy consumption in developed countries is responsible for nearly two thirds of the environmental load we exert on nature. Future projections show that our Canadian demands for energy will double in the next 50 years and grow 5 times in the next hundred. Remaining oil and gas reserves have 45 and 69 years

of reserve life remaining respectively while coal, the most globally evenly distributed fossil fuel, has over 200 years remaining.

Over the next 20 years Ontario's population is predicted to grow from the current 11 million to more than 15 million people. By the year 2020, nearly 7 million of those people will live within the Greater Toronto Area, an increase of over 2 million from our current population.

Transportation is responsible for 60% of our air quality problems. Recent studies on transportation commissioned by the GO Transit Ontario predict there will be 55% (approx. 1.5 million) more vehicles on the road by 2020. Over the same period we will require nearly 40 percent more electricity generation than is currently used in the province today. Currently eighty five percent of Ontario's total energy use is derived from fossil energy sources. This dependence on fossil fuel continues to grow and in 20 years we will be burning approximately 43 percent more fossil energy in total than we do today. Energy production and use in all sectors account for nearly 80% of all air pollution generated locally. Every year in North America we are using solar energy it took the Earth nearly 1 million years to store as fossil energy. Rates of energy consumption and extraction are increasing with time. Replacing coal with natural gas as an energy source has become an environmentally acceptable alternative but it still represents consumption of limited fossil resources and it still produces nitrogen oxides and carbon dioxide. As we continue to deplete non renewable resources, increasing prices and decreasing supply may lead us right back to coal as the fuel of the future under conditions where our choices may become very limited. The potential for economic and social upheaval this will cause is well documented by Jay Hanson (see www.dieoff.org). For cities and governments, every development decision that encourages or increases our dependence on fossil energy will further indenture their citizens and future generations to huge environmental, social and economic costs.

The way we use energy has a direct impact on environmental quality, so much so that it can be said that an **energy policy is environmental policy**. Our large footprints and specifically, our high energy consumption is a threat not only to the environment but also to our economy. Our dependence on cheap energy to remain competitive is dangerous at a time when we know fossil energy supplies are finite and declining. With less than 49 years supply in global oil reserves, 60 for gas and 200 for coal, a total dependence on fossil energy, and a predicted growth of over 40 per cent in demand for fossil energy in Ontario in the next twenty years - we are not in a good position. Looking objectively at this dynamic, we are increasing our dependence on limited resources that do not have a future. At the same time local and national policies continue to be biased toward

keeping energy cheap and doing nothing substantive to develop renewable energy and energy efficient technology and infrastructure. This kind of thinking is the product of outdated superstitions that businesses will flee unless we keep them supplied with cheap energy. These policies are lethal to our future. European economies are as competitive as we are with energy costs that are triple our own. They are also more diverse and are fully involved in the fastest growing technology in the world - renewable energy.
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Disconnecting our economy from its fossil fuel dependency is the most effective way to make us sustainable in the future. With our current technology, experts believe we can reduce our energy and material intensity by a factor of 10 without affecting the quality of our lives. This means we would create 10 times fewer air and water emissions from transportation our homes and industry. If we could also do this with our electricity demand it would mean that we could live comfortably within half the existing hydroelectric output in the province.

We can create a wonderful and sustainable future for our children if we chose today to measure and then work to reduce our footprints. We can do this by purposefully reducing the energy and material intensity of our economy. By applying existing technology, placing value on energy conservation and solid economic incentives to back them up we can improve the environment, create an unprecedented renewal of our economy by creating jobs supplying and servicing renewable and energy efficient technologies that we could market worldwide.

We are told that global competition is a reality and we must be competitive, however, energy costs for electricity and fossil fuels in Europe are many times what we pay domestically. If European and other economies can compete evenly with us today, what will happen when our energy prices inevitably rise tomorrow? Our large footprints put us at a competitive disadvantage and exposes our regional economy to great risk, particularly if fossil energy availability or costs change over the next two decades. Our disproportionately large footprints also endanger the security of our future and our health yet there is little urgency to deal specifically with these long term issues of sustainability. This highlights a total vacuum in strategic planning on the part of environmentalists who get lost in fighting the most "urgent"

issues of the day, the politicians who placate them and the media who take sound bytes from both and fragment the issues further.

Footprints are not about how bad things are, but how they are. Once we clearly understand the ecological bottom line, just as in economics, it will become clear what we must do. Thinking globally and acting locally means knowing what is globally sustainable and acting locally to reshape our technology, economy and society to operate therein. Just as with our personal finances, if we know how much natural capital we have and how much we use, we can more clearly understand the direction we must move toward. When we have a sense of direction the appropriate sense of purpose and urgency will come naturally and so will the solutions. Psychologists know that in human dynamics, in order to deal with issues, we first need to break through denial and make things real. We need to account for our effect on the natural capital of the Earth and make it a real part of our economic and our political thinking and strategy. Many experts agree that the move towards sustainability can create new business opportunities, more jobs, restore our environment, and promote social stability through solutions that are innovative, practical, and profitable. It is time to start the move. The first steps towards sustainability are taken when we begin to measure our use of natural capital and reduce our footprints.

Progress must be redefined in a way that will inspire civil society to move beyond the confusion and lack of direction of issue based environmentalism. The challenge for us is to bring about an awareness of root causes and give people the appropriate situational awareness or a sense of the "Big Picture". Current rates of growth in consumption is putting us at a dangerous level of overexploitation and exhaustion of living systems and the mass of us really don't know what to think. Politicians and people will continue to be lost in a sea of environmental noise from the thousands of competing environmental issues unless we begin understand these issues within the context of sustainability. We cannot deal with these issues unless we understand this larger context, much like looking out the window of a plane to see if we are diving toward the ground or flying straight and level. Once we have this context we can begin to see the opportunities not just the risks. From this we can create a meaningful and inspiring vision for a sustainable future in which we can create new jobs, restore our environment, and promote social stability. With this common sense of purpose we can make a better and more sustainable world a reality. This is our challenge for Environment Week and every day!

Web Resources

Redefining Progress
http://www.rprogress.org/resources/nip/links/nip_links.html

World Wildlife Fund International - Living Planet Report 2000
http://www.panda.org

Natural Capitalism - Paul Hawken
http://www.motherjones.com/mother_jones/MA97/hawken.html
http://www.naturalcapitalism.org/

Jay Hanson's Website
www.dieoff.org

Ecological Footprint of Cities
http://www.urban.nl/publ/ecofoot.htm

Ecological Footprints for students
http://www.ecovoyageurs.com

Centre for Sustainable Studies – Universidad Anáhuac de Xalapa

Centro de Estudios para la Sustentabilidad, Xalapa, Mexico
http://www.edg.net.mx/~mathiswa

EARTHDAY US - Clean Energy -Business
http://www.earthday.net/action/downloads.stm#businesses

Natural Step US
http://www.naturalstep.org/

The Canadian Sustainability Report
http://www.sustreport.org/

UNEP-WORLD ENVIRONMENT DAY
http://www.arab-business.net/undp/environment_day.html

EARTH COUNCIL
http://www.ecouncil.ac.cr/rio/focus/report/english/footprint/

The Footprints of Nations Study

The "Footprints of Nations" report compares the ecological impact of 52 large nations, inhabited by 80 percent of the world population. It also shows to what extent their consumption can be supported by their local ecological capacity. All the calculations are based on official UN statistics. One key finding is that today, humanity as a whole uses about one-third more resources and eco-services than what nature can regenerate. In 1992, this ecological deficit was less than one tenth.

As the study is updated every year, the assessment method is improved, and hopefully, more countries included. The original report and a computer diskette with the more updated spreadsheets for all the ecological footprint calculations for each country (based on 1993 data) are available through ICLEI (http://www.iclei.org/iclei/ecofoot.htm). An even earlier version comes with a live interview and can be downloaded from the server of the Earth Council, Costa Rica (http://www.ecouncil.ac.cr/rio/focus/report/english/footprinthttp://www.ecouncil.ac.cr/rio/focus/report/english/footprint), who commissioned the first study. The latest updates for 1995 are co-sponsored by the Union Bancaire Privée, Geneva Switzerland, Redefining Progress, San Francisco, and the Centro de Estudios para la Sustentabilidad, Xalapa Mexico.

Note that the footprint sizes are larger than the ones reported in Wackernagel and Rees's *Our Ecological Footprint* (1996) (http://www.newsociety.com/oef.html). Rather than increased consumption, these figures have changed due to a significantly improved accounting methodology. Now we include sea space; consumption is documented more completely; pasture and forest yields as well as CO_2 absorption are based on more realistic assessments; and most important, all the results are now expressed in the same unit: bio-productive space with world-average productivity.

References:

Wackernagel, M and William Rees. Our Ecological footprint, 1996 New Society press BC http://www.ire.ubc.ca/ecoresearch/ftprbook.html

Wackernagel, M., Larry Onisto, Alejandro Callejas Linares, Ina Susana López Falfán, Jesus Méndez García, Ana Isabel Suárez Guerrero, Ma. Guadalupe Suárez Guerrero, *Ecological Footprints of Nations: How Much Nature Do They Use? How Much Nature Do They Have?* Commissioned by the Earth Council for the Rio+5 Forum. Distributed by the International Council for Local Environmental Initiatives, Toronto, 1997.

Wackernagel, M., Larry Onisto, Patricia Bello, Alejandro Callejas Linares, Ina Susana López Falfán, Jesus Méndez García, Ana Isabel Suárez Guerrero and Ma. Guadalupe Suárez Guerrero, "National Natural Capital Accounting with the Ecological Footprint Concept." *Ecological Economics* (June 1999 Vol.29 No.3).

Ecological Footprints and Ecological Capacities of 150 Nations: Living Planet Report, 2000. Mathis Wackernagel, Alejandro Callejas Linares, Diana Deumling, María Antonieta Vásquez Sánchez, Ina Susana López Falfán, Jonathan Loh, Redefining Progress, San Francisco, USA, www.rprogress.org; Centro de Estudios para la Sustentabilidad, Xalapa, Mexico www.edg.net.mx/~mathiswa
WWF International, Gland, Switzerland, www.panda.org

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