

The Engineering Explorations Newsletter

What makes up the environment? Where does it begin? Where does it end? Does it end? Think about these questions. The answers might not be quite as quick and easy as you think.

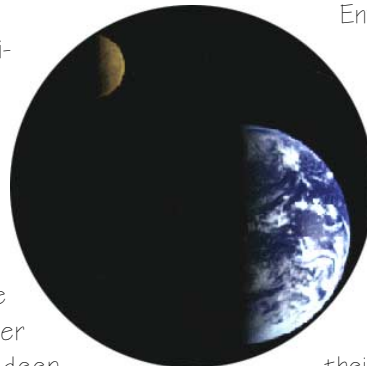


The environment consists of all the air, water, soil, plants and animals (including humans) on, in and above the planet. So, if you were going to study the environment where would you start? The answer really depends on what you were interested in and what you wanted to study. The environment is a huge and complex field of study which is of great concern to many different types of scientists and people.

In other words, environmental engineers can go to a injured site and figure out ways of returning the land or the water or the air to its natural state. (Injured sites are where the land, water or air has been contaminated by pollution or scarred by things like mining.) Equally importantly, environmental engineers also design and develop engineering projects so that environmental and human impact are minimal; ensuring that sites are never injured in the first place.



Because it is so big it is called a multi-disciplinary subject. This means that chemists, physicists, biologists, botanists, meteorologists, engineers and other scientists all study the environment, but each of them looks at it from a different point of view. Native people have been keepers of the planet for many thousands of years. Over time they have developed a deep understanding and vast knowledge of the Earth's complex rhythms. This perspective on the environment is very rare and one from which everyone involved in environmental studies could benefit.



Environmental engineering is a field in which Aboriginal peoples are uniquely placed to make a lasting and significant contribution. Around the world, indigenous peoples have always had a remarkably close relationship with their environment. From hunters or trappers whose lives depended on many forms of specialized environmental knowledge, to healers and medicine people who were responsible for the health and well-being of whole communities, their respect for the earth and

Environmental engineers tend to focus on two things:
· the management and protection of the environment from an engineering perspective; the design of processes to treat waste so that environmental impacts are minimized;
· the development of solutions to engineering problems which minimize the threat to human and environmental health.

all other aspects of their environment was fundamental to everyday living. Environmental scientists are only now coming to realize the importance of preventing problems rather than curing them. Aboriginal peoples experience with land, water and resource management combined with a concern for the next seven generations is ideal for providing a basis not only for understanding today's complex environmental phenomena, but also for preventing future problems.



NATIVE ENGINEERS

A place to meet engineers from your community.

Name: Marc Paré
Nation: Mi'gmaq
Profession: Mechanical Engineer
School: École de Technologie Supérieure (ETS)
(Université du Québec à Montréal)
Degrees: B,Eng.
Favourite thing about job: Dealing with people and working with technical projects.

In 1979, when Marc Paré walked into the airplane engine manufacturer Pratt and Whitney for his first day of work as a mechanical technician he already knew where he wanted to be later in life. He told his co-workers and his boss that his goal was to become one of the company's engineering managers. Today his title is Manager of Vane Rings (vane rings are one of the many thousands of components in an airplane engine) and 18 people in two different departments report to him.

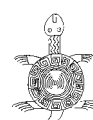
"I had a CEGEP DEC in Mechanical Manufacturing. When I decided to go back to school for my engineering degree I knew it was a long-term decision." Mr. Paré continued to work at Pratt and Whitney while he worked toward his degree in mechanical engineering part-time at night. It took 8 1/2 years. "I had a clear goal to improve my skills and get a better job. In the end, it paid off."

He thinks having a goal is very important. "I would tell students to do that, sit down and visualize where they want to be five years from now." But he is quick to point out that you do not reach a goal without exerting effort, "It's the 3 S approach - study, study, study. It's the key to success."

Mr. Paré believes it is important for young Native people to continue their studies into CEGEP and University. "It gives you confidence. It gives you the ability to communicate well. And engineering, it gives you the ability to look at a problem and review it analytically from all sides." These skills, he says, are vital to economic growth in Aboriginal communities. "I think if we could have more people involved with engineering or with university degrees, we could be self-sufficient. There are lots of ideas in our communities, but not enough training in how to make the ideas real."

Community needs aside, Mr. Paré insists that students pursue studies for their own benefit, "Going to University and CEGEP is a contract. It's like a full-time job, but you don't get paid. It's also a long-term decision that means hard work. You have to do it for yourself."

L'École de Technologie Supérieure is the school of engineering attached to l'Université du Québec à Montréal (UQAM). It offers undergraduate degree in Construction Engineering, Electrical Engineering, Mechanical Engineering, and Robotics Engineering. The language of instruction at ETS is French. For more information write to the following address: 1100 Notre-Dame West, Montreal, Quebec, H3C 1K3, or call (514) 396-8800. You can also visit ETS on the Web, <http://www.etsmtl.ca/>





ENGINEERING NEWS

E.A.G.L.E. Project (Effects on Aboriginals from the Great Lake Environment)



Since 1990, the 63 Aboriginal communities around the Great Lakes, in partnership with the Assembly of First Nations and Health Canada, have been taking part in E.A.G.L.E. Project, a long-term study to evaluate the effects of environmental change resulting from industrial and agricultural pollutants. E.A.G.L.E. Project is groundbreaking in that it blends the “knowledge, needs, and issues of First Nation people with western scientific methodology.”

Since the end of World War II, the Lakes have become the center of a huge population concentration and one of the biggest industrial, shipping and agricultural areas in North America. All of these activities are to some extent polluting, although much less now than 50 year ago. Nevertheless, they have affected the environment in and around the Lakes, and, in doing so, they have also affected the Native communities in the area.

There are more than 360 different pollutants in the lakes, including things like DDT, dioxin, PCBs, mercury and human sewage. You’ve heard the expression “You are what you eat.” Well, if you are eating fish which lives in polluted water or plants that drink polluted water or the animals which eat those fish or plants - you are also eating the pollution. It may be pollution in very small quantities or concentrations, but over time some types of pollution have the ability to build up in your body - in places like fatty tissue and the liver - and this can lead to serious health effects.

From 1990-1997, E.A.G.L.E. Project researchers conducted six in-depth studies. They began by looking at the diet of people in Native communities. Then they looked at where the plants, animals and fish in that diet came from and how these foods were exposed to pollutants. The researchers found that animal populations have been affected by pollutants in a number of ways - populations had declined, tumours had become common, fertility had decreased etc... Human physical health does not seem to have been affected by exposure to the pollutants, however, there is more to complete health than physical being. The researchers involved in E.A.G.L.E. Project take a “culturally relevant view of health” which understands that for First Nations peoples “both health and environment are holistic” and so “social and cultural impacts are also considered health effects.” In other words, they understand that changes in the environment can lead to changes in lifestyle. So if, for example, certain fish stocks no longer existed because they had been killed off by pollution, the entire life of a community might be dramatically changed. Using this approach, researchers are also studying how communities have been and are being affected by changes in hunting, fishing, gathering and trapping patterns brought about by the industrial development of the Great Lakes region.

The E.A.G.L.E. Project will continue through 1999 at least. For more information contact, The Assembly of First Nations, 1 Nicholas Street, Suite 1002, Ottawa, Ontario, K1N 7B7. Phone (613)241-6789

WHAT COULD YOU DO AS AN ENVIRONMENTAL ENGINEER?

Well, think about all the things in your community which have a potential impact on the environment and/or human health right now. You could make sure your community’s water system was well-maintained and safe. You could design a fuel containment system to keep gas or oil from leaking into the soil. You could help your band council decide how and where to place new residential or commercial developments so that they do not harm local wildlife. The possibilities are close to home and almost endless. In the near future, the move toward self-government will require environmental engineers with an understanding of local realities, needs and priorities in order to negotiate with corporations and government. So now or in the future, becoming an environmental engineer will provide you with a concrete, exciting and challenging way to contribute to the well-being and development of your community.



COMMUNITY PROFILE

Joamie School, Iqaluit

So little is understood about the North; how we live, what languages are spoken, the cost of living, the environment, the cultures, the political economy of the Arctic.... we felt it necessary to help educate the rest of the world about us.

Joamie the man...

Joamie played an important role in establishing the community of Iqaluit. In 1940, the American Armed Forces arrived in Frobisher Bay intending to set up a base of operations for the the World War 2 effort. They had unsuccessfully tried to find suitable land in Lake Harbour. Discussions with Joamie and Tigullagaq eliminated a place called Sarraq as a possible selection as Joamie felt the area wasn't suitable due to high winds and soft mud. Joamie and Tigullagaq thought the flat land of Iqaluit was the best place on Frobisher Bay. So, it was decided to set up the base in this area. Originally, the base and subsequent town was called Frobisher Bay, but later became known as Iqaluit.

Shortly after the base was established, the Hudson's Bay Company wanted to relocate to Iqaluit. Joamie was instrumental in helping them move.

Joamie was a respected and kind man, who felt it was his responsibility to provide meat for widows and the needy. His cooperation and exploration in the early days resulted in the foundation of our community.

Joamie School is named in his honour.

The above article has been slightly modified from the Joamie School Web Site the content of which is developed completely by students. In February 1996, when they began this project, Joamie School was the only school in the Baffin Region to have a web site.

Joamie School History and Accomplishments

Joamie School opened its doors in 1989.

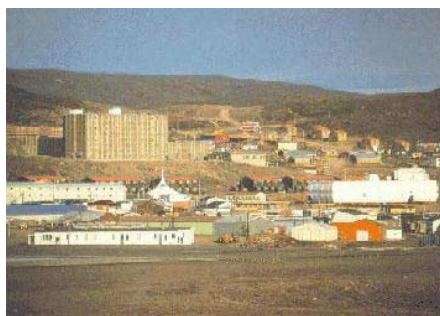
Joamie School became the first school in Canada to reach Earth Status, having completed 1000 environmental projects under the SEEDS Foundation (Society Environment & Energy Development Studies). Joamie is a Green School.

Joamie Staff received the Hilroy Fellowship Award for "The Greening of Joamie" in 1994. Joamie was featured in the April '94 issue of OWL Magazine. "Above and Beyond, "Imperial Oil Review", a text book on Nunavut (Lerner Publications) and another on the environment (Ginn) feature Joamie's accomplishments

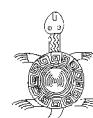
The Joamie School team received Prime Minister's Award for Excellence in teaching Math, Science, and Technology in 1995.

For any comments and questions you may have about the North visit our web site at <http://www.nunanet.com/~joamie>, or contact us at Joamie School, Box 910, Iqaluit, NT, phone:(819)979-6206, fax: (819)979-0686, email: joamie@nunanet.com.

Source: Nunanet
<http://www.nunanet.com/sum1.jpg>



Iqaluit in the summer time.



FUN FACTS AND THINGS TO THINK ABOUT



Cat
Maximum speed: 48 kph

Slug
Maximum speed: 0.048 kph



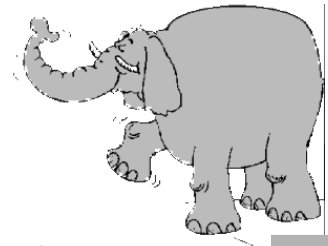
Some Sluggish Facts

- Coastal BC supports the largest number of slugs in Canada - as many as 3 per square foot of garden soil!
- Only the Prairie provinces with their hot, dry summers and bitterly cold winters are wholly unpopular with slugs.
- Slugs avoid light. They seek out cool, moist dark conditions.
- If a slug loses one eye and is stuck in the light, it will crawl around in circles in the direction of the missing eye. It thinks it's moving towards the dark.
- Slugs cause the loss of about 36,000 tons of potatoes every year - the average annual consumption of about 400,000 people.
- Banana slugs deposit a valuable nitrogen-rich fertilizer in their droppings, giving young redwood trees a boost in growth.
- Members of the family *Vitrinidae* range into the Arctic and can sometimes be seen gliding along the surface of the snow.

Source: The Little Green-Brown Book of Slugs



Three-toed sloth
Maximum speed: 0.24 kph



Elephant
Maximum speed: 40 kph



Chicken
Maximum speed: 14.4 kph

Did you know?
Water stays in Lake Superior for an average of 191 years, in Lake Michigan for an average of 99 years, in Lake Huron for an average of 22 years, in Lake Ontario for an average of 6 years and in Lake Erie for an average of only 2.6 years (because it is so shallow)?

Source: E.A.G.L.E. Project

Man has responsibility, not power.
—Tuscarora proverb



PUZZLES AND GAMES

The Environment

J P H E Q R E D U C E P C B I Z A N
 E Z N U T I Y X L Z N B L Y T L R P
 O O M M S R E N F G I C A C O E W
 U Y R E C L A M A T I O N X N L R F
 K Q C C W N N W V C N H R W A T E R
 R B A H I V I H O T E A N Q Z B S S
 N I M M E M L M A N E Z T V K W P D
 Y O A Z R M P M W E R A L U Q T E Y
 W L I W X L I E G M I R V O L T C N
 S O L T E N C S H N N D G F C L T L
 E G T X A N S S T O G I E U H A O D
 D Y E N E I I B C R J V R S E R L P
 I W T I R F D Q W I Y T I L A U Q E
 C S C E D J I E H V S F F I L T T Q
 T S U C A J T A M N H Y B O T A N Y
 S S L A B O L G O E P I H S H N L P
 E T A R E P U C E R R G B P K H O A
 P T T C O M M U N I T Y B F Q E R X

Can you find the words below in the puzzle to the left?

- | | |
|--------------|-------------------|
| AIR | MACRO |
| ANIMALS | MICRO |
| BIOHAZARD | MULTIDISCIPLINARY |
| BIOLOGY | NATURAL |
| BOTANY | PESTICIDES |
| CHEMISTRY | PHYSICS |
| CLEAN | PLANTS |
| COMMUNITY | POLLUTANT |
| COMPLEX | QUALITY |
| CONSTRUCTED | RECLAMATION |
| CONTAMINANTS | RECUPERATE |
| CYCLES | REDUCE |
| ENGINEERING | REMEDICATION |
| ENVIRONMENT | RESPECT |
| FISH | REUSE |
| GLOBAL | SCIENCE |
| HEALTH | SOIL |
| LOCAL | WASTE |
| | WATER |

This puzzle was created at www.puzzlemaker.com by Network Solution Developers, Inc.

A man has to get a fox, a chicken, and a sack of corn across a river. He has a rowboat, and it can only carry him and one other thing. If the fox and the chicken are left together, the fox will eat the chicken. If the chicken and the corn is left together, the chicken will eat the corn. How does the man do it?

Source: <http://members.aol.com/ajkori/BTWA1.html>



Two red cards and two black cards are shuffled and placed face down. You select two- what is the probability that they are the same color?
 Source: The Grey Labyrinth, <http://www.wx3.com/labyrinth/potans.htm>

All about us

Native Access provides culturally relevant learning opportunities in science, math, engineering and technology to Aboriginal students and their teachers across Canada.

Established in 1993, the project's ultimate goal was to increase the representation of Aboriginal peoples among the the ranks of practicing engineers and scientists in Canada.

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