The word "Biotope" is rendered in a large, stylized font where the letters are overlapping and semi-transparent. The colors of the letters are: 'B' is green, 'i' is purple with a purple dot above it, 'o' is red, 't' is orange, 'o' is yellow, 'p' is blue, and 'e' is grey. The letters are set against a plain white background.

Biotope

Art + Environment > Sustainable Architecture

biotope
from June 30
to September 18
2016

A message from the Mayor



The Côte-des-Neiges–Notre-Dame-de-Grâce (CDN–NDG) Borough’s elected officials indicated their commitment to making CDN–NDG a healthy borough. The concept of health took shape when the *Déclaration pour un arrondissement en santé [Declaration for a Healthy Borough]* was adopted by the Borough council on June 4, 2013. That declaration guides all the commitments and actions undertaken by the Borough with the objective of fostering and promoting a healthy living environment. The idea of “health” in this context is interpreted in its broadest sense and includes political, economic, social, cultural, environmental, behavioural and biological factors, and reflects the concept of sustainable development.

The new Notre-Dame-de-Grâce Cultural Centre was designed, built and equipped, and its range of services set up, with this in mind. Compliance with LEED construction standards and the educational program on sustainable development confirm the commitment of the borough’s elected officials to taking concrete action to improve the well-being of current and future citizens.

RUSSELL COPEMAN
BOROUGH MAYOR

A message from the Director



The Culture, Sports, Leisure and Social Development Department is pleased to be able to implement an enhanced cultural services offering with the opening of this magnificent space, the Notre-Dame-de-Grâce Cultural Centre. Like other cultural sites in the borough, this new centre is first and foremost a very special place where artists and citizens can meet. Whether through books, or the visual and performing arts, such stimulating encounters are essential to the healthy development of individuals and the community as a whole. They help develop social bonds in an urban environment by promoting openness and inclusiveness. The Department works zealously to provide residents with innovative, rewarding programs that will enable sustainable community development, and you may rest assured of our deep commitment to that mission.

SONIA GAUDREULT
DIRECTOR, CULTURE, SPORTS, LEISURE
AND SOCIAL DEVELOPMENT

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View inside the
Notre-Dame-de-Grâce
Cultural Centre

Art + Environment > Sustainable Architecture

In 2011, the Quebec government adopted its *Agenda 21C for Culture*, to serve as a framework for building stronger ties between culture and the social, economic, and environmental dimensions of sustainable development. That same year, Montréal became the first city in the world to recognize culture as the fourth pillar of sustainable development. The belief is that to improve the quality of life of communities, cultural development is intrinsically linked to the concept of sustainable development.

In the 21st century, our maisons de la culture and our libraries function like **BIOTOPES** in the urban fabric, providing places for meeting, exchanging ideas and making discoveries. As habitats for art and literature, they help residents develop new points of view and examine the current concerns of city life. The designers of the Notre-Dame-de-Grâce Cultural Centre—a consortium made up of the firms Atelier Big City, FSA Architecture and L'OEUF—have made this space a model for sustainable construction by respecting LEED building criteria. Stemming from the intention to create an educational program focusing on sustainable architecture, the *Biotope* project presents a selection of five works that prompt examination of various environmental, economic, social and cultural issues. These works will enable visitors to gain a better understanding of both the challenges facing and the solutions offered by sustainable architecture.

The **ZONÉ VERT** collective highlights Quebecers' crucial relationship, throughout their history, with wood and forests, symbols of warmth, protection, and survival. **ANDRÉANNE GODIN** looks at how we exploit our natural resources, especially minerals, and the impact it has on our communities. **ANA REWAKOWICZ** focuses on creating her own biotope, as a way to illustrate the basic needs of plants and the principle of interdependence that unites us all. **JANNICK DESLAURIERS**, with a surreal textile installation, looks at crucial questions of water use and the conservation of natural environments. Lastly, **DIANE LANDRY** takes a simple and fun approach to discussing the concepts of recycling and rehabilitating materials.

We invite you to visit this exhibition and experience the architecture of the venue with the help of a cultural mediation program devoted to sustainable development.

Here's wishing you some wonderful discoveries!

YOUR CULTURAL PROGRAMMING TEAM



Zoné Vert PAROLES D'ARBRES / TREE TALK

The **ZONÉ VERT** collective believes that artistic creation is inseparable from the natural environment. Inspired by the Land Art movement, Michel Bachelet and Christine Juillard concentrate mainly on outdoor interventions as a way to explore the deep ties that bind humans to the environment. The concept of working in situ (creating a work that belongs to a specific place) is central to their artistic practice, along with an emphasis on natural materials that have been obtained locally. Such an approach seeks to establish a symbiotic and respectful relationship with nature, a kind of osmosis that cannot help but call to mind the balanced relationship that bonded Aboriginal peoples to their lands. It is obvious to Zoné Vert that nature is not simply an unlimited reservoir of material resources, but rather a vital habitat that we must preserve for life itself—as well as an ideal place for contemplation, discovery and wonder.

Tree Talk consists of a tree trunk sectioned into eight longitudinal slices. Hung in alignment vertically, the slices are spaced equally apart from one another. The very core of the tree, and its bark, are still clearly visible. Each slice has precisely cut rectangular openings that allow the play of shapes and light, energizing the spatial qualities of the installation. Pitted with such cavities, the trunk reveals to us a secret, intimate view of its nature, of its history. As a whole the installation forms a precise and intriguing work, one that evokes both the “inner” life of wood and the many processes behind its transformation—from the time the tree is first cut in the forest, to its distribution as a product on the market.

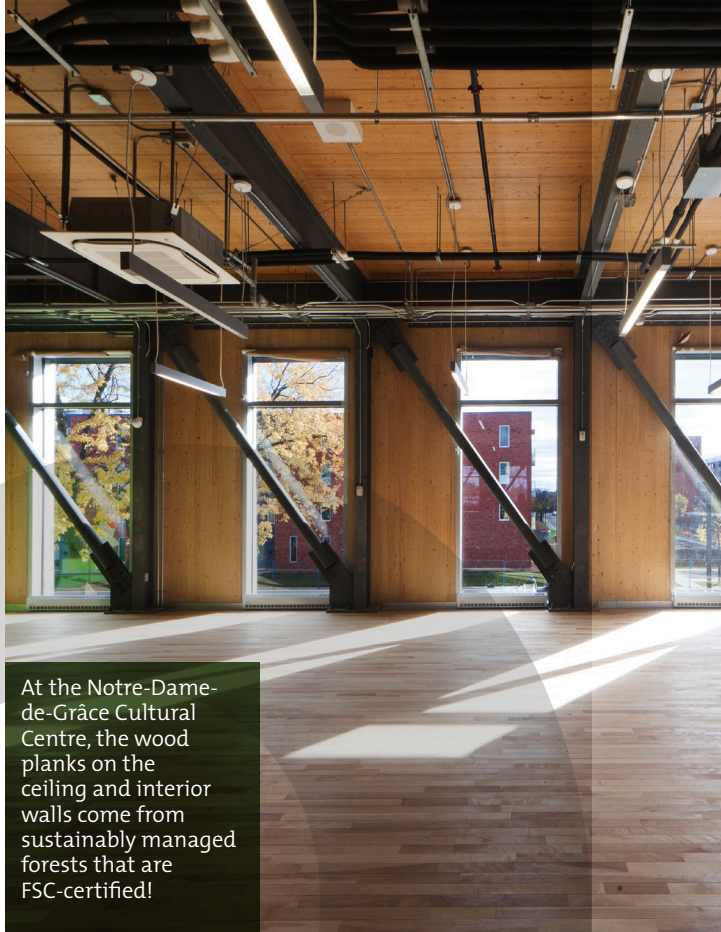
Zoné Vert
Paroles d'arbre / Tree Talk (detail)
Cedar trunk
2011

The roots of our history

A heritage to preserve

The history of Québec is directly linked to the forest. From the woodsmen of voyageur tales, to heroic loggers like Joseph “Jos” Montferrand, legends about men who have braved the forest are a constant in the Québec imagination. Generations of Quebecers have told stories of men going upriver to fell timber in the fall, then returning in the spring in a great log-drive to the sawmills downstream. Québec was also famous for its large white pine trees, which were prized by the British shipbuilding industry as material for its majestic tall ships. Later on, the development of a pulp and paper industry—one of the jewels in the province’s crown—made Québec a major player in the North American economy.

To preserve this heritage and this source of wealth, we must devote ourselves to sustainable forest management. Over 85% of Québec’s forests are industrially exploited and the vast majority have been victims of clear-cutting, with no plan in place for their future development. This ruthless cutting has had a tremendous impact not only on forests, but on soil and **HYDROGRAPHY** as well. However, this type of practice is being left behind. Today, nearly 90% of the forests on government land are certified under sustainable forest management standards,¹ the most common one being Forest Stewardship Council (FSC) certification. This standard tracks wood products from forest to shelf, providing assurance that the trees have been harvested with chain-of-custody certification and under sustainable parameters.



At the Notre-Dame-de-Grâce Cultural Centre, the wood planks on the ceiling and interior walls come from sustainably managed forests that are FSC-certified!

We Quebecers have a special relationship with the forest. Since time immemorial, the woods have drawn us in...

A paradox made of wood

In Québec, wood is a natural choice for building. It is a quality, flexible material that offers great opportunities for architectural innovation. It can be used for framing, carpentry, flooring, stairs—and even tiles! Contrary to popular belief, a wooden building is three times more environmentally friendly than a concrete construction. Using wood means less energy is required for transporting materials, and that reduces the **ENVIRONMENTAL FOOTPRINT** of the building. Wooden buildings are also more energy-efficient—they cost less to heat because wood is an excellent insulator. Moreover, wood is safe: should there be a fire, it will transmit heat less quickly than concrete and even steel.



When designing the Notre-Dame-de-Grâce Cultural Centre, the architect recognized the essential contribution that trees make to our quality of life. Multiple views to the outside and the importance of natural light were taken into consideration in its planning. Huge windows let its users enjoy great vistas of the park or contemplate the magnificent maple tree that extends over the rear courtyard.

The social importance of trees

The trees in our cities are much more than urban decoration. Through their presence, they promote physical well-being by improving air quality. They create shade and reduce the effect of heat islands, as well as provide a home for urban wildlife. We also need wooded areas so that we can maintain a healthy psychological balance amid so much massive architecture, because trees and shrubs give a human dimension to the city. Street plantings create more comfortable (and safer) areas for pedestrians. Urban woodlands and municipal parks are ideal places for city dwellers to connect with the natural environment—places for nature interpretation, for becoming more aware of the importance of the conservation of green spaces, and for learning about the many aspects of ecology.



Andr anne Godin LE MUR / THE WALL

Growing up in Val-d'Or, **ANDR ANNE GODIN** saw the familiar landscapes of her childhood steadily transformed by mining, which is central to the economy of the Abitibi region. *Le Mur / The Wall* is composed of two main elements, each reflecting the artist's drawing practice. *Sterile Mountain / Montagne st rile*, the larger of the two elements, uses yarn as its material. In a way, the wool fibre—in stone-like colours forming a massive, irregularly undulating cover evoking a rockfall—stands in for the sinuous lines of drawing. The repeated intertwining of the yarn produced by the crochet work echoes the dogged efforts of mineworkers. Here stone, so hard and so cold to begin with, becomes something soft and pliable. This rock "fabric" makes reference to the rubber tire mats used during mine blasting operations to keep flying rocks and other clouds of volatile dust close to the ground. Rising majestically in the space, this strange wall of "rocky" wool also brings to mind the embankments around mine sites, which form a kind of social and environmental link between mining companies and the communities in which they operate.

The quieter component of this impressive installation is a small acrylic ink-on-paper drawing aptly entitled *The Wall, 2011- / Le mur, 2011-*. It depicts a reconstructed landscape, a rock wall erected around a mine site on which vegetation is somehow tentatively sprouting. These two artefacts reflect the complex links between the mining companies and the population of the Abitibi. A vital economic engine for the region, the mining industry has left a deep imprint in environmental and social terms. Both works show the contradiction at the core of it. The image of the wall may suggest a lack of transparency on the part of the industry in regard to its social, economic and environmental impacts on future generations. By exposing the tip of the iceberg, the artist hopes to make the public aware of this reality, but above all, attempts to spur a dialogue with visitors.

Andr anne Godin
Sterile Mountain / Montagne st rile (detail)
Crocheted yarn, wooden structure
Various dimensions
2012-2013

Striking a balance

The illusion of abundance

Québec is known for its immense mineral potential. The only niobium producer in North America and one of only three in the world, Québec is also Canada's largest producer of iron and zinc, and second-largest producer of gold. With 25 active mines and more than 350 companies mining surface mineral substances, the value of Québec's mineral shipments reached \$8.7 billion in 2014.² Such economic benefits are invaluable for a number of the province's regions, and without this industry, entire cities might be abandoned. To ensure sustainable development, it is mission-critical to strike a balance between mining's multiple economic, environmental, ethical and social challenges. The main issue in respect to subsurface mining lies in the non-renewable nature of mining resources and, with the arrival of new technologies, the rate at which mining is taking place is weakening communities' sustainability.

How can intergenerational equity be ensured if, once it has been mined, the ground below can no longer support families?



Sustainable architecture promotes the use of recycled metals in construction, as is the case for the Notre-Dame-de-Grâce Cultural Centre's steel structure.

Preserving ecosystems

One of mining's major impacts is the degradation of **ECOSYSTEMS** and landscapes. From the outset, working a mine involves the disappearance of large portions of primary forests, vital habitats for many animal species. This in turn threatens the invaluable incubators of life, such as swamps and small streams, found within them. The water is often affected by the emission of acid leachates (discharges of the polluted water used in processing ore) that reach groundwater level.

Various types of soil, having been subject to deforestation for road construction and ore extraction, become brittle. Fortunately, several strategies are now being implemented to reduce these negative impacts on people and the environment. For example, mounds of earth are set up to mark the perimeter of mining sites and reduce noise pollution. Areas around such sites are re-greened in order to improve their general appearance and restore former natural environments, and old open-pit mines are filled in so that plants can grow there once again. A similar approach was adopted in the construction of the Notre-Dame-de-Grâce Cultural Centre.



The Centre's location was conceived with its immediate "natural" environment in mind. It was built in a non-flood zone and its design had very limited impact on the existing vegetation. A majestic maple tree, for example, was preserved during construction despite its problematic location. Also, land on which another structure had previously stood was chosen to reduce the footprint of a new building in the borough. Furthermore, better control of the pollution caused by construction activities was provided. Particular attention was paid to cleaning the streets every day and the drainage wells were covered with geotextile filters to restrict the potential discharge of pollutants. Finally, stringent management of hazardous liquid products was able to limit the possible risk of spillage into the city's water-supply system.



Ana Rewakowicz LSS (LIFE SUPPORT SYSTEM)

ANA REWAKOWICZ has been working for several years on a body of work that she calls the *Inflatables*. It consists of inflated structures made of various polymers, resins, plastic membranes, nylon fabrics and tubing. These structures sometimes serve as clothing, shelters, or self-contained installation systems. The artist invites us to discover one of her major works, *LSS (Life Support System)*, which comprises seven transparent spheres connected to a central feeding device. Each sphere contains a substrate in which plants grow. The nourishment they need is provided by a pump, which itself is controlled by a computer that calculates in real time the variations in carbon dioxide, water and oxygen within the system. A lamp placed over each sphere ensures light, crucial for the plants' existence. What we have before us, then, is an elegant and proactive system for hydroponic cultivation. Yet despite its obvious complexity and sophistication, the sustainability of this work depends, oddly enough, on visitor participation.

You see, the artist made small openings in the spheres where a straw can be inserted and visitors can blow in a supportive breath of CO₂. In this way, the work cleverly moves between art, science and play. Although it borrows from scientific processes and the sophisticated aesthetic of a laboratory, Ana Rewakowicz's modular system largely relies on the simple, playful contribution of individuals and counts on their sensitivity and capacity for wonder. Through this, the artist emphasizes the ideal, utopian link between humankind, science and nature. She calls attention to this interdependent relationship and, to a greater extent, points to human beings' responsibility for preserving ecosystems that are now badly threatened: large forests, the lungs of the earth; sources of fresh water; agricultural land, overfarmed and contaminated; and oceans, whose resources still seemed inexhaustible only a few decades ago.

Ana Rewakowicz
LSS (Life Support System) (detail)
Technical design: Pierre Jutras
and Keith Pattington
Programming: Bruno Schmidt
Mixed media
7 x 7 metres
2013-2015

The interdependence of environments

Plants play a major role in Earth's ecosystem. They are the basis of **FOOD WEBS** and provide food for millions of living species. By converting CO₂ in the atmosphere, plants are the source of the oxygen we breathe. However, human activities create air pollution, which causes a lot of damage to vegetation. The increase in pollutant gases interferes with trees. Airborne particles clog the pores of leaves and hamper **PHOTOSYNTHESIS**. Acid rain, the result of a rain cloud encountering one filled with pollutants, results in forest dieback on a massive scale: the trees die and the soil becomes infertile, leading to the degradation of flora.

Green roofs, like the one at the Maison de la culture de Côte-des-Neiges, are truly natural filters. They absorb particles and other pollutants in the air such as carbon dioxide (CO₂). One square metre of green roof eliminates 0.2 kg of dust in the air per year. By purifying and cooling the surrounding air, a green roof alleviates the urban heat island effect and harmful smog episodes. A cooler building also requires less air conditioning, so it produces fewer **GREENHOUSE GAS (GHG)** emissions. A green roof retains up to 75% of rainwater, helping to reduce overloads at wastewater treatment plants. What's more, flora and fauna have been quick to spot this natural oasis in the heart of the city! Greening practices such as green roofs, as well as urban agriculture and residential plantings of vegetation that attracts bees, done in sufficient quantity and diversity, make the city more hospitable to them. This in turn makes it possible to increase **BIODIVERSITY** through pollination.

One of the solutions to air pollution lies in the continued greening of urban spaces, in every possible form.





Though the CO₂ supply is vital for plants, it can be harmful for human beings. In the same spirit as Ana Rewakowicz, the designers of the Notre-Dame-de-Grâce Cultural Centre devised a system for regulating carbon dioxide that assesses air quality based on the number of people in an enclosed space. In addition, with energy saving in mind, an unoccupied room will only receive a minimum rate of ventilation and air exchange.

Outdoor air is often of better quality than indoor air, yet Canadians spend on average 90% of their time indoors!

A breath of air...

Motor vehicles are a major source of air pollution. When an engine burns fuel, it emits fine particles, nitrogen oxide, carbon monoxide and **VOLATILE ORGANIC COMPOUNDS (VOCs)**. However, thanks to trees, outdoor air is often of better quality than indoor air! An average mature tree produces close to 120 kg of oxygen from CO₂ annually. In one year, it removes the amount of carbon produced by a car running for about 42,000 km.³ We can also limit air pollution by opting for alternative means of transportation, something that sustainable architecture aims to do by offering easier access to public transit, bicycle parking and charging stations for electric cars.

Indoor air is often of very poor quality. Glues, paint and household cleaning products, just like cigarette smoke, give off fumes—sometimes toxic ones called volatile organic compounds—that affect our health. Easily entering our lungs, these substances can cause various respiratory problems. A number of actions can improve the quality of indoor air during the construction and planning of sustainable buildings, for example: selecting refrigerants with limited impact on the **OZONE LAYER**; using low-emitting rather than conventional building materials (adhesives, paint, varnishes and wood composite products); controlling tobacco smoke by creating non-smoking areas; and choosing environmentally friendly cleaning products.



Jannick Deslauriers LES NAUFRAGÉS / THE SHIPWRECKED

The work of **JANNICK DESLAURIERS** is the result of a unique approach combining poetry, narrative and technical invention. Her installations make full use of the exhibition space to recreate natural environments. To achieve this, she uses a fabrication technique that allows a set of startling illusions to emerge from the intrinsic qualities of her textile materials—translucence, light, colour and reflectivity. The various forms that arise from this process are fascinating. You would guess they come from a fabulous laboratory, after a long process of mutation or crystallization. They carry our imagination to a world beyond time, to a place both magical and disturbing. *The Shipwrecked* presents huge, elegant water lilies floating in space, recalling the swarming and multifaceted life of marshes—fragile but vital aquatic environments that are both natural filters for water and places that give birth and life to countless species of insects, fish and birds. Three containers, strangely out of place, are planted at the centre of this environment, like vessels that have accidentally run aground. It is a brutal intrusion into the marshy ecosystem, one that reminds us of the dangers that come with our intensive global trade in goods.

Through this accidental, enigmatic and unavoidable presence, the artist raises subtle questions about the commercial, environmental and cultural depletion that underlies our frenetic transport of goods and fossil fuels by massive cargo ships. The intensification of such maritime traffic sometimes also conceals the grim reality of illegal immigration. And, because it transports algae, insects and undesirable fish species from one marine environment to another, it is responsible for the accidental contamination of water and flora. By turns, Jannick Deslauriers' work involves a kind of harmony with nature—a direct, tangible experience of matter, light, and space—and a critique of human beings' interventions in the natural world, their greed, and their reckless unheedfulness.

Jannick Deslauriers
Les naufragés / The Shipwrecked (detail)
Crinoline, silk, organza and thread
Various dimensions
2016

Look to the source

Essential to life

The facts are simple: water is the main component of living beings—and it is essential for the growth of all forms of life. Humans need it for health, agriculture, energy production, transport, recreation and more; its value to us is infinite. Water first appeared on Earth about four billion years ago, and since then its volume has remained constant. It is always the same water that continuously circulates, transforms and recycles itself. Moreover, its uneven distribution on the surface of the planet makes it a coveted resource. Québec, with its tens of thousands of rivers and its more than three million bodies of water, has 3% of the reserves of renewable fresh water in the world, and nearly 40% of all this water is concentrated in the watershed of the Saint Lawrence River!⁴ But our water conservation record is horrible.

In 2006, we consumed an average volume of 795 litres of water per person per day, while the Canadian average was 591 litres.⁵ Sustainable water management is undeniably a vital issue for the twenty-first century. Every day, two million tons of waste are dumped into our planet's rivers, lakes and streams.⁶ Right now in Québec, some municipalities cannot even provide their residents with drinking water! It's crucial that we take action and protect our most basic resource.

Québec is one of the biggest consumers of water in the world. We can all do more—to use less daily!

The Notre-Dame-de-Grâce Cultural Centre is conserving water by installing low-flow plumbing fixtures (toilets, showers, urinals and faucets) and by planting drought-resistant greenery—and those are just two examples. However, we can also change our habits at home. Outside, we can collect rainwater and wait until nightfall to water the garden—and we can plant things in that garden that don't require much water. Inside, we can take a shower instead of a bath, and we can put something in the toilet tank (a brick, a full water bottle, etc.) to limit the consumption of water when the time comes to flush.



Available in a store near you

Many different factors motivate people who purchase local materials and products. For some, it is only an environmental issue: transportation over long distances means wasted energy, more traffic, potential loss of nutrients in foods, more packaging to protect goods, and more greenhouse gas emissions that damage our health and atmosphere. However, there are other benefits to consuming locally. Some see it as a way of supporting the local economy, preserving jobs and fostering the economic growth of their municipality, region, province or country. Others see a more social aspect, that of supporting companies that adopt fair working conditions and pay fair compensation to their workers.

Favouring conscientious farming practices and ensuring strict compliance with recognized standards are additional motivations for those who advocate buying locally.⁷ The truth is that to reduce our environmental footprint—from building materials, everyday products, or food—we need to think carefully about the origin of the goods that we use and consume.

Sustainable buildings are made using different construction, metal and manufactured materials that are made locally. The Notre-Dame-de-Grâce Cultural Centre contains examples of this in its laminated wood panels, reinforced steel, concrete, steel framework, and miscellaneous metals fabricated with steel. What's more, most of the Centre's furniture was designed and manufactured right here in Québec.





Diane Landry
*Le nième continent /
The Umpteenth Continent* (detail)
Installation with automation,
bicycle rims, selected objects, wood,
aluminum, motors, ball bearings
5 components, 157 x 90 x 65 cm (each)
2014

Diane Landry

AUTOUR DU NIÈME CONTINENT / A TOUR OF THE UMPTEENTH CONTINENT

To experience the work of **DIANE LANDRY** is to enter a fascinating world of light, movement, colour and sound. Yet her pieces are composed of very simple materials, many of them salvaged or found objects like plastic bottles, strainers, bicycle rims, old turntables, and umbrellas. The artist uses this jumble of items to assemble fascinating sculptures and installations that arouse wonder and surprise. This ability to enchant explains the skill of Diane Landry. Using mundane objects from everyday life, she develops a total sensory experience, a feast for the eyes, ears and heart. In her generous and teeming universe, commonplace household strainers become supernatural frameworks for light projections, plastic utensils assemble themselves into a fisherman's net, umbrellas unfurl in balletic movements, salad spinners become devices for viewing moving images, and plastic tarps are transformed into ocean waves. However, these reclaimed objects are only a premise, a springboard for cerebral projection into the imaginary. They serve as a pretext for a long process of "engineering" that relies on extensive knowledge of automation and motion dynamics and on the intricate gears of machines and clockworks. This is certainly the case for the work *The Umpteenth Continent*.

The basic materials used to create this installation are, once again, disarmingly simple: bicycle rims, plastic bottles, wooden rulers, brushes, plastic pails, and so on. Five metal frames support two rims each, at the centre of which is a wire stretched horizontally to support a bottle that resembles a floating core. A large wooden ruler connects the rims to a small motor that keeps them in continuous motion. An everyday object hangs from a rope, suspended from each of the balancing circles. The measured weight of the various objects is essential to generating the rocking movement of the quasi-spheres. The mass reacts to the swinging and creates perpetual motion in the hypnotic manner of a clock pendulum. Viewed as a whole, the refined mechanisms of the "umpteenth continent" suggest the image of an antique globe perched on a wooden stand. But although the overall aesthetics of this installation leave us with enchanting and contemplative impressions, we are left to wonder if this other continent is not to be likened to those huge and alarming "floating islands" that have been formed in the Pacific Ocean by the fragments of plastic waste discarded by humans.

The spiral of (over)consumption

At the point of no return

Every year, about 250 million tons of plastic are produced, and 6.4 million tons of waste are thrown or dumped into the world's seas. Plastics make up 90% of the waste that ends up floating in the ocean. Sea currents then transport these materials towards new "continents" of waste whose surface area may reach nearly 3.5 million square kilometres! These floating continents are made up of all kinds of things, including plastic fragments and pellets. In some places, the amount of plastic in seawater can be ten times greater than the amount of plankton, the basic link in the chain of marine life. That is why we now hear about "plastic plankton." Such plankton acts like a sponge that retains many different toxins, including persistent organic pollutants, known to harm the ecosystem, and introduces concentrations of toxic elements that are up to *one million* times higher than the norm! The whole food chain is affected by these enormous concentrations of plastic in

the ocean, since the smaller pieces are ingested by birds or small fish that are, in turn, eaten by larger species. Unfortunately, the task of cleaning the oceans seems insurmountable: the area to be covered is too great, and the costs are colossal. But keep in mind that the life span of plastic waste can extend for a *thousand years*. And biodegradable plastics accounted, in 2012, for only 0.27% of world production.

Pollution of the oceans has a huge impact on marine life. One of the most telling examples of this is turtles choking on the plastic bags they mistake for jellyfish.



*"There is nothing we can do about it now, except do no more harm."*⁸

Marcus Eriksen, Director of Education and Research, Algalita Marine Research Foundation

Sustainable consumption

Eco-citizenship

The current model of consumption drives us to produce huge amounts of waste, since we must constantly consume goods to keep the economy rolling. And the more goods we consume, the more we generate. In Québec, each person produces an average of 420 kilograms of household waste per year—that's 1.15 kilograms every day!⁹

Sustainable development depends largely on a balance between economic and environmental needs. We have no choice but to design sustainable models of production, consumption and (re)use.

Think about ways we can **REDUCE** our waste. We can favour long-lasting products rather than disposable ones, and choose products with the least amount of packaging. Avoid non-recyclable, non-compostable or over-packaged products.

RE-PURPOSE used products or, conversely, donate things we no longer need to recycling organizations, to avoid waste. Organize multi-family yard sales, shop at bazaars, lend and borrow tools with neighbours and friends, and shop at stores that offer used products

RECYCLE as many products as you can, once you have no need of them, so that similar new products may be made from them. In Montréal, recycling is a breeze: every neighbourhood has recycling bins, and the eco-centres will accept any recyclable and reusable materials that cannot go in the green bins.

RECLAIM AND CONVERT. Reclamation refers especially to composting, which is a biological process that turns kitchen and garden waste into humus-rich soil that's useful for horticulture. Since 2008, thousands of Montrealers have had access to compost pickup services, and this year nearly 135,000 addresses are being added to the 215,000 households that already benefit from the service.¹⁰

In the case of the Notre-Dame-de-Grâce Cultural Centre, 88% of its construction waste (concrete, wood, metal) was diverted from landfills and recycled into new material. Also, some of its building materials, such as steel, aluminum, insulation, concrete and brick, include recycled components.

About the artists

Zoné Vert

Michel Bachelet and Christine Juillard, who have been working together since 2006, created the Zoné Vert collective. In using this name, they wish to underscore their identification with rural life and their desire to interact with the natural environment. Zoné Vert grew out of the aim of the two French-born artists to combine their creative powers to produce large-scale works in the natural settings of Québec. The collective has participated in many in situ or site-specific art events, notably: *Field Work Land Art* in Maberly, Ontario (2014); *Créations sur le champ [Creations On the Spot]* in Saint-Hilaire, Québec (2014);

Symposium international d'art in situ [International Symposium of In Situ Art] at the Jardins du précambrien in Val-David, Québec (2013) and *Jardins réinventés [Reinvented Gardens]* at Lac des Nations, near Sherbrooke, Québec (2013). Their credits also include several solo exhibitions: *À géométrie variable [Variable Geometry]* at the Maison des arts et de la culture de Brompton cultural centre in Brompton, Québec (2013) and *Import-Export, Installations* at the Espace Hortense du P'tit Bonheur gallery in Saint-Camille, Québec (2011).

Andréanne Godin

Originally from Val-d'Or, Andréanne Godin lives and works in Montréal. She has received several grants from the Conseil des arts et des lettres du Québec and the Canada Council for the Arts. Her work has recently been presented in various solo exhibitions at such venues as the Centre d'exposition in Val-d'Or, Québec (2016), Art Toronto international modern and contemporary art fair (2015), Galerie B-312 in Montréal (2013) and Centre d'exposition Circa in Montréal (2012). Her work has also been featured in many group exhibitions in Québec, France and Cuba. She is currently represented by Montréal's Galerie Nicolas Robert.

Ana Rewakowicz

Born in Poland, interdisciplinary artist Ana Rewakowicz now lives in Montréal. She holds a Bachelor of Fine Arts degree from the Ontario College of Art and Design, Toronto (1993) and a Master of Fine Arts degree from Concordia University, Montréal (2001). Her art crosses into many disciplines, including science, invention, design and architecture. She has exhibited in Canada and abroad, and is a recipient of many grants and awards. Her most recent exhibitions were presented at the Przemiany Festival and the Copernicus Science Centre in Warsaw, Poland (2015); Galerie B-312 in Montréal (2015); Bial del Mundo in Mar del Plata, Argentina (2014); ISEA 2014 in Dubai, United Arab Emirates; the British School at Rome, Italy (2014); and the Polish Institute in Rome, Italy (2013).

Jannick Deslauriers

Jannick Deslauriers was born in 1983 in Joliette, Québec. She lives and works in Montréal and teaches visual arts at Collège Marie-Victorin. She holds a Bachelor of Fine Arts degree from Montréal's Concordia University (2008) and a DEC in Fine Arts from the city's Collège Marie-Victorin (2005). Her credits include the solo exhibitions *Mémoire tangible [Tangible Memory]* at the Musée d'art de Joliette, Québec (2011); *What is Left (Ce qu'il reste)* at Circa, Montréal (2011) and at the contemporary art gallery L'Écart... Lieu d'art actuel in Rouyn-Noranda, Québec (2010); and *Battlefield* at galerie [sas] in Montréal (2009). Her group shows have included *What is Left* (duo), at Whippersnapper Gallery in Toronto (2010), and *Ego(s)*, Circa's annual benefit exhibition, in Montréal (2010).

Diane Landry

Born in Cap-de-la-Madeleine, Diane Landry lives and works in Québec City. She initially studied natural sciences and then worked in agriculture for five years. At age 25, she took a different tack, believing it would be easier to change the world through a career in the visual arts. The artist holds a Bachelor of Visual Arts degree from Laval University, Québec City (1987) and a Master of Fine Arts degree from Stanford University, California (2006). Her work has been widely exhibited and she has performed extensively in Canada, the United States, South America, Europe, China and Australia.

In 2009, the Musée d'art de Joliette in Québec published a monograph on her body of work to accompany her first retrospective exhibition, *The Defibrillators*. Her first retrospective in the United States, *The Cadence of All Things*, was mounted in 2013 at the Cameron Art Museum in Wilmington, North Carolina. In 2014, Diane Landry received the Jean-Paul-Riopelle Career Award from the Conseil des arts et des lettres du Québec; more recently, she was the recipient of a prestigious Fellowship from the John Simon Guggenheim Memorial Foundation in New York.

Diane Landry
Brouillard / Fog, 2012
Video still



Glossary

BIOCENOSIS: the biological community of animals and plants that live in the same environmental conditions and in a given space.

BIODIVERSITY: biological diversity, that is, the diversity of the living world within nature.

BIOTOPE: a physical environment in which one or more species lives. Examples: a grassland, moorland, desert, river, or lake.

VOLATILE ORGANIC COMPOUNDS (VOC): carbon-based chemicals that evaporate easily at room temperature and then assume a gaseous state in the atmosphere. A number of these compounds are involved in the photochemical reactions responsible for the formation of ground-level ozone. Others, such as benzene and formaldehyde, are also considered toxic and can cause adverse health effects.

OZONE LAYER: the part of the stratosphere that contains a large amount of ozone and absorbs most of the ultraviolet rays emitted by the sun.

ECOSYSTEM: a large area characterized by its environment and by the animals and plants that live there. The complete group of living beings that share a biotope.

ENVIRONMENTAL FOOTPRINT: the estimated damage caused to the environment by an individual, family, business or country, based on the surface area of land and sea they need for procuring resources (food, energy, transport, and so on) and for absorbing their own waste. A measure of the pressure that humans exert on their environment.

FOSSIL FUELS: non-renewable energy sources produced by extremely long geological processes that convert biomass (such as plankton and ferns) into carbides (such as coal) and hydrocarbons (such as oil and natural gas).

GREENHOUSE GAS (GHG): gaseous components of the atmosphere, both natural and anthropogenic (originating in human activities), that absorb and emit the infrared or thermal radiation reflected by the surface of the Earth, the atmosphere and clouds.

HYDROGRAPHY: the entire set of flowing and standing waters of a country; the science of describing such bodies of water.

RAW MATERIAL: a basic material made by nature and extracted by humans for the manufacturing of products or energy. Examples: various ores, oil, rubber, coffee beans.

PHOTOSYNTHESIS: the process by which chlorophyll-based organisms (green plants, algae and some bacteria) capture light energy and convert it into chemical energy. Photosynthesis is responsible for almost all of the energy available for life on Earth.

POLLINATION: the transfer of (male) pollen onto the (female) pistil of a flower to ensure its fertilization. Pollen is carried by wind, insects, or other animals.

FOOD WEB: a set of food chains that connect the organisms of a biocenosis. These food chains ensure the circulation of matter and energy in an ecosystem.

SUBSTRATE: the layer of soil composed of inert materials and nutrients that plant roots need in order to grow.

Games

Are you a parent, youth facilitator or cultural mediator? Here you'll find games and other interesting links to offer children of all ages, so they can expand their knowledge about environmental issues.

Want to know your environmental footprint?

As honestly as possible, answer the following questions on the youth page of the Quebec government's Ministry of the Environment website (in French only): <http://bit.ly/biotope-empreinte>
This will help you see if you should change some of your behaviours to reduce your impact on the environment.

Head to the Forest Academy website and enjoy an exciting adventure in the middle of the forest while discovering all kinds of things about trees and their environment!

The website explores five different topics: Tree Knowledge; Cycle of Life; Beautiful Biodiversity; Trees in our Lives; and Forest Protection.
www.theforestacademy.com

Take a look at a fun comic strip: Just Look Natural!

Join Marty, Jessie and Quantum as they explore the process of naturalization in their yard by focussing on native plants.
<https://wonderville.org/app/asset/justlooknatural>



To learn more

LEED certification
www.cagbc.org

FSC certification for the forest industry
<https://ca.fsc.org>

Québec Ministry of Energy and Natural Resources
<http://mern.gouv.qc.ca/english/department/index.jsp>

Interdisciplinary Research Centre on Sustainable Development Operationalization
http://www.cirodd.org/eng/index_e.html

Suggestions for making environmentally and socially responsible choices
<http://www.equiterre.org/en>

Société environnementale de Côte-des-Neiges
<http://socenv.ca>

David Suzuki Foundation
www.davidsuzuki.org

**Eau Secours!
Québec Coalition for Responsible Water Management (in French only)**
<http://eausecours.org>

Agenda 21C (in French only)
<http://www.agenda21c.gouv.qc.ca>

UNESCO World Heritage
<http://whc.unesco.org>

Bibliography

Anctil, François. *Développement durable: enjeux et trajectoires*. Québec City: Presses de l'Université Laval, 2015.

Billioud, Jean-Michel. *Protéger la Terre: les grands enjeux de l'environnement*. Paris: Nathan, 2006.

Cantin, Danielle and Catherine Potvin. *L'Utilisation durable des forêts québécoises: de l'exploitation à la protection*. Sainte-Foy: Presses de l'Université Laval, 1996.

Chaire en éco-conseil. *L'industrie minière et le développement durable*. Chicoutimi: Université du Québec à Chicoutimi, 2012.

Desjardins, Richard and Robert Monderie. *L'Erreur boréale / Forest Alert*. Montréal: National Film Board of Canada, 1999. [DVD].

Jacquemont, Pierre. *Le dictionnaire du développement durable*. Auxerre: Éditions Sciences Humaines, 2015.

Mercier, Annie and Jean-François Hamel. *Rivières du Québec: découverte d'une richesse patrimoniale et naturelle*. Montréal: Éditions de l'Homme, 2004.

Meredith, Sue. *Why Should I Bother About the Planet?* London, U.K.: Usborne, 2008.

Perez, Mélanie. *Mon petit manuel du développement durable*. Paris: Auzou, 2010.

Québec Ministry of Energy and Natural Resources. *Report on Mineral Activities in Québec 2012*. <https://www.mern.gouv.qc.ca/english/publications/mines/publications/publication-2012-chapter1.pdf>

Sanson-Stern, Catherine. *Environnement & écologie*. Arles: Actes Sud Junior, 2008.

Sanson-Stern, Catherine. *Le développement durable à petits pas*. Arles: Actes Sud Junior, 2012.

Thibodeau, Jean-Claude. *Québec à l'heure du développement durable*. Québec City: Presses de l'Université du Québec, 2011.

Toutain, Caroline. *L'air et sa pollution*. Toulouse: Milan, 2014.

Research and writing

The Côte-des-Neiges–Notre-Dame-de-Grâce Borough's Culture Division team, including Robert Dufour, Colin Earp-Lavergne, Mégane Guillard, Julia Martinez-Turgeon, Caroline Richard, Marc Alain Robitaille and Rémi Turgeon
Société environnementale de Côte-des-Neiges (SOCENV) – page 27

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Notes

- 1 <http://www.mffp.gouv.qc.ca/forets/amenagement/amenagement-certification.jsp>
- 2 <http://www.investquebec.com/international/en/industries/mining/a-wide-variety-of-metals-and-minerals-within-easy-reach.html>
- 3 Catherine Stern, *Environnement et Écologie*, Actes sud Junior/Ademe, 2008, p.19
- 4 http://www.mddelcc.gouv.qc.ca/eau/inter_en.htm
- 5 <http://www.mamrot.gouv.qc.ca/grands-dossiers/strategie-quebecoise-deconomie-deau-potable/a-propos-de-la-strategie>
- 6 <http://eausecours.org/2009/10/international-fleuve-saint-laurent/>
- 7 <https://www.desjardins.com/ressources/pdf/per0715e.pdf?resVer=1436376516000>
- 8 http://www.notre-planete.info/actualites/actu_1471_continent_dechets_pacifique_nord.php
- 9 <http://www.statcan.gc.ca/pub/16f0023x/2006001/5212375-eng.htm>
- 10 <http://www.socenv.ca>



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NOTRE-DAME-DE-GRÂCE CULTURAL CENTRE

6400 Monkland Avenue, Montréal H4B 1H3
Métro Villa-Maria / Buses 103 and 162
Zoné Vert

MAISON DE LA CULTURE DE CÔTE-DES-NEIGES

5290 Côte-des-Neiges Road, Montréal H3T 1Y2
Métro Côte-des-Neiges / Bus 51
Andréanne Godin
Ana Rewakowicz

MAISON DE LA CULTURE DE NOTRE-DAME-DE-GRÂCE

3755 Botrel Street, Montréal H4A 3G8
Métro Villa-Maria / Bus 24
Métro Vendôme / Bus 102
Jannick Deslauriers
Diane Landry