Eau de Paris présente

O!

l’expo

L’eau dans tous ses états

English version

Exposition au Pavillon de l’Eau

L’eau. Un service public
Water, **water everywhere...**

It can be in the form of steam, liquid, or ice.
It covers **70%** of the Earth’s surface.
**97% of the** total available is salty.
It makes up **90%** of the human lungs.
It makes up **70%** of a man’s body, **55%** of a women’s, and **78%** of a baby’s.
It can be polluted and it can be purified.
It is treated with activated charcoal or ultra-violet (UV) light.
It can be potable or non-potable.
In France, each person consumes **150 liters** per day.
Just **1%** of that is for drinking.
In Paris, the daily consumption is the equivalent of **1,5 times the volume** of the Tour Montparnasse building.
It is either cold or hot.
It is both a food and a source of energy.
WATER, of course. It’s everywhere. Invaluable and rare, water is at once universal and multiple. Its diversity contributes to its mystery. It is never the same, yet always essential.

O ! l’expo was designed in partnership with the Natural History Museum of Toulouse. It is an invitation to discover the importance of water in the human body, in nature, in the city, in society, and in the universe.

Scientific and technical, playful and informative, tactile and virtual, it calls on all the senses in order to create an understanding of the importance of water in the light of the changes our societies and our climate are undergoing.

In a global approach, you will be shown the relationship between water and life, water and human beings, and water and society. You’ll be taken to the streets of Paris to discover how this resource is shaping the city of tomorrow: urban biodiversity, renewable energy, and reinvented usages of water are three illustrations of the influence water can have on our life model.

Presented all throughout the year 2015, O ! l’expo is in line with the dynamic of a year that will be rich in international events centered on the environment and climate, such as the 7th World Water Forum in South Korea and the 21st Climate Change Conference, COP 21, to be held in Paris late in the year.

2015, a major year for the future of the world, is the opportunity to discover the potential and the diversity of the resource that water is.

So what are you waiting for?
Dive into… the water!
LANDSCAPES, PONDS, FORESTS, SEAWEED, APPLES, MANGOES, BEANS, MOSQUITOES, CATS, ELEPHANTS, LADYBIRDS, CHILDREN, WOMEN, MEN, TREES, VIRUSES, BACTERIA, CELLS, MEADOWS, MARINE ENVIRONMENTS…. BIODIVERSITY, OR THE DIVERSITY OF THE LIVING, IS EVERYWHERE. IT IS THE RESULT OF AN EVOLUTION OF SPECIES THAT HAS CONTINUED FOR 3.5 BILLION YEARS AND IS THE PRODUCT OF NATURAL PROCESSES. WE OURSELVES, HOMO SAPIENS, ARE PART OF IT.


THE CONCEPT OF BIODIVERSITY IS BOTH COMPLEX AND SIMPLE.

IT IS:

- THE DIVERSITY OF SPECIES (FORMS OF LIFE) - THE VARIETY OF SPECIES: PLANTS, ANIMALS (INCLUDING HUMANS), FUNGI, BACTERIA, MICRO-OrgANISMS, VIRUSES, ETC.;

- THE DIVERSITY OF LIVING ENVIRONMENTS, THE HABITATS (ECOSYSTEMS) WHICH EXIST ON EARTH - FROM PLAINS TO TROPICAL OR TEMPERATE FORESTS, FROM HOT AND COLD DESERTS TO STREAMS, PONDS, CITIES, ETC.

- THE GENETIC DIVERSITY WITHIN EVERY SPECIES.

**Did you know?**

1.8 million animal and plant species have been identified by scientists today, which is thought to represent approximately only 10% of the total biodiversity on Earth.
What purpose does biodiversity serve?

Biodiversity is **essential for life**, because it is what enables ecosystems to provide us with **multiple direct services**. In addition to food, oxygen, raw materials, medicines, etc., many species - insects, bats, birds, etc. - ensure the **pollination of plants**, without which our fruits and vegetables would disappear.

Natural environments contribute to **natural purification of water** (the soil and plants, in a very long cycle, work to de-pollute water), **flood regulation** (wetlands have the ability to absorb excess water), **improving our surroundings** (parks, gardens, woodlands, and rivers provide us with leisure and vacation spots).

Biodiversity also provides indirect services. Many **innovations**, proven or to come, are derive from observation of nature.

Today everyone is familiar with **Velcro**. The technique was created in 1941 by engineer George de Mestral, who observed how **burdock flowers** stuck so tightly to his trousers and his dog’s fur that he could not get rid of them.

**Submarines** were reportedly created from the study of the movements of the **nautilus**, a mollusk that lives in the sea.
Why protect biodiversity?

Since the origin of life, the Earth has undergone several crises of species extinction. The most recent once has been the dinosaurs extinction, 65 million years ago. That crisis had multiple causes, all related to natural phenomena - cooling of the climate, meteorites, intense volcanic activity, etc. The scientific community recognizes that today we are experiencing the sixth crisis of extinction of species - one which, for the first time, is of human origin. Since the start of the 19th century, our activities have profoundly altered the natural environment, causing the disappearance of a certain number of species.

But the disappearance of species causes imbalances in the operation of ecosystems and directly threatens human wellbeing, and even human survival. That is why the biodiversity preservation, along with the struggle against climate change, is currently a major environmental concern.

At the Earth Summit in Rio de Janeiro, Brazil in 1992, the entire world became aware of the need for protecting our ecosystems for future generations. The term “biodiversity” became a part of the language at that time, along with “sustainable development.”

The erosion of biodiversity

5 main causes:

- the destruction, reduction, and fragmentation of natural habitats
- the overexploitation of certain species
- pollution of water, soil, and air
- introduction of invasive exotic species
- climate change

Sources: French Ministry for Environment, Sustainable Development, and Energy
Paris commits to preserving biodiversity

The City of Paris has had a commitment to protecting biodiversity for some years now. It is pursuing three goals:

- fostering the ecological continuities that are essential to maintaining and restoring diversity of life in the city: avenue trees, green spaces, the River Seine, canals, watercourses… all of these are part of a fabric that interconnects Paris and the large natural spaces of the region and is favorable to the circulation of plant and animal species;

- making biodiversity a key element of municipal action, in the areas of urban planning, management of public spaces, purchasing policy, and sustainable management of green spaces and watercourses;

- raising urban dweller’s awareness and mobilizing actors in the territory to transmit to all Parisians and to future generations a culture of urban ecology, in particular through the creation of the Paris Biodiversity Observatory.

Urban biodiversity… Is there such a thing?

The urban environment constitutes a space where fauna and flora can develop. There are more than 2,000 wild species living in Paris. This biodiversity that surrounds us plays an important role in the city’s functioning: It cools the atmosphere, which is often several degrees hotter in cities. It humidifies the air, which is generally too dry in urban environments. It absorbs certain pollutants, such as particles emitted by cars…

The quality of urban life has everything to gain from an increased presence of nature, and above all a diversified nature!

On this touchscreen you can have access to an inventory of fauna and flora in Paris, including species living in aquatic environments like the Seine, ponds, and canals. Cataloguing the extant animal and plant species is necessary to safeguard this biodiversity.
Eau de Paris takes action to promote biodiversity

Eau de Paris produces and distributes the water consumed in the Capital. One of its main missions is to preserve the quality of the water upstream of its collection points. That is because the higher the quality of the raw water collected, the better the water delivered to Parisians will be, and the less processing it will need. But quality raw water requires high-quality natural environments. Everything depends on the capacity of the soil and the vegetation to filter and retain pollution.

Eau de Paris has established protection perimeters around its drinking-water collection sources. It makes sure that no pollution-generating activities take place within those perimeters. It uses no pesticides.

From more than 10 years, Eau de Paris adoptes environmental management practices in all the natural spaces it manages, which account for a considerable total area. These natural environments are highly diversified: meadows, woodlands, wetlands, lawns, hedges, afforested areas, watercourses, etc. These practices have encouraged the establishment of rare species - birds, insects, amphibians, orchids, ferns, etc. Inventories by naturalists make it possible to monitor the evolution of this environmental wealth, which is increasing regularly.

What are the Green and Blue Plotting Diagrams?

The Green and Blue Plotting Diagrams are aimed at preserving and restoring ecological networks - interlinked natural spaces that enable animal and plant species to move about in order to nourish themselves, reproduce, find shelter, etc.

The growing fragmentation of the territory (caused by roads, motorways, railroad tracks, urbanization, etc.) is damaging to biodiversity. Species cannot survive without moving about and interacting. Unlike humans, who eat, rest, and raise their young within the same space, plants and animals need travel pathways in order to fulfill their life cycle, but also to ensure genetic mixing.

The Green and Blue Plotting Diagrams (or ecological networks) are made up of biodiversity reservoirs (places for feeding, for reproduction), and of ecological corridors (travel pathways) linking those reservoirs together.
PART 1 > Water and biodiversity in the city

2,400 sq. km.*
The total area of the drinking water catchment areas of subterranean origin managed by Eau de Paris to provide Paris with drinking water. In these territories, Eau de Paris takes action to limit present or potential sources of pollution in concert with all the actors concerned, and in particular farmers.

* 240,000 hectares or 593,000 acres

1,700 hectares*
The total number of hectares of natural spaces managed by Eau de Paris.

* 17 sq. km. or 4,200 acres

470 km
The total length of the Paris aqueducts. 80% of that length is planted with grass, and Eau de Paris’s easement area is 6 to 20 meters wide. That space serves as a refuge for plants and animals.

53 hectares*
The total area of natural spaces present around and on the roofs of the six water processing plants operated by Eau de Paris.

* 0.53 sq. km. or 130 acres

15 hectares*
The approximate area of natural spaces present at the nine main potable and non-potable water reservoirs, buried and semi-buried, of Paris, including the Montsouris drinking water reservoir (14th District), and the non-potable water reservoir at Passy (16th District).

* 0.15 sq. km. or 37 acres

137 farmers
The number of local farmers who are working with Eau de Paris to preserve the natural environment. Their participation consists either in keeping agricultural land in grass or practicing organic agriculture, which significantly reduces the quantities of nitrogen and pesticides in order to preserve the quality of the water.

Key figures:

- **2,400 sq. km.**
- **1,700 hectares**
- **470 km**
- **53 hectares**
- **15 hectares**
- **137 farmers**
Every city needs energy - to light its streets in the evening, to heat residential and office buildings in winter, for operating appliances, for providing public transportation... simply put, to provide a comfortable life for its inhabitants.

And yet energy, as we mainly know it today, is not renewable. Derived from fossil fuels (petroleum, coal, natural gas, etc.), it is used up much more rapidly than it takes to re-create reserves of these fuels - millions of years. And in addition, fossil energy generates large amounts of greenhouse-effect gases and so contributes to global warming.

The solution? Develop renewable sources of energy.

France and the European Union (EU) ratified the Kyoto Protocol in 2002, precisely to prevent and correct the deleterious effects of climate change.

The EU has set itself the goal of deriving at least 20% of the total energy consumed in the Union from renewable sources by 2020.

For France, that means increasing the share of renewable energy in its total energy consumption from 10.3% to 23%.

The new European agreement signed in October 2014 (the Energy and Climate Package 2030) provides for increasing the goal for Europe to 27% of the energy mix by 2030.

What are renewable energy sources?

The term refers to sources of energy whose natural renewal, regular or constant, is sufficiently rapid for them to be considered inexhaustible on the scale of human time. It includes energy produced by the sun (thermal or photovoltaic), wind, water (hydraulic or geothermal), and using organic materials (biomass), etc. The carbon balance of energy from renewable sources is very good, unlike that of fossil energy, which makes it a useful tool in the struggle against climate change.

Sources: French Ministry for Ecology, Sustainable Development, and Energy
Eau de Paris: Working towards tomorrow’s sustainable city

In its own way, Eau de Paris is taking up the challenge of energy efficiency and diversity. The Régie Eau de Paris, the Paris city agency which provides public water services, has proposed to the City of Paris to develop new energy technologies via innovative local solutions drawing on its core competency - the production of potable water.

The Clichy-Batignolles eco-quarter (Paris, 17th District) is a fine example of renewable energy produced locally from potable water.

Eau de Paris is using a backup well in the Albian, which is a geothermal aquifer, to locally produce heat for the eco-quarter, which will be home to 6,500 people by 2016.

What is the Albian?

The Albian is an immense underground aquifer which extends beneath the entire Paris basin over more than 100,000 sq. km., dating from approximately 100 million years ago. Located at a depth of approximately 650 meters, the aquifer represents 700 billion cu. m. of water, protected from surface pollution. As a result, it is water of very high quality.

What is climate change?

Greenhouse-effect gases play an important role in regulating the climate. Without them, the average temperature on Earth would be -18°C instead of +15°C and life might not even exist. So in fact the greenhouse effect is a natural and necessary phenomenon. However, since the 19th century and the Industrial Revolution, humans have increased the amount of greenhouse-effect gases present in the atmosphere considerably by emitting large quantities of carbon dioxide, methane, and other gases. Between 1750 and today, human activities have disturbed Earth’s energy balance, resulting in warming of the planet’s surface. Concentrations of CO2 in the atmosphere have increased by 40%, and of methane (CH4) by more than 150%. As a result, the climate balance has been destabilized and the climate is readjusting itself with an increase in the greenhouse effect.

Sources: French Ministry for Ecology, Sustainable Development, and Energy
The Albian in Paris:
Emergency water

Used today by Eau de Paris, the water of the Albian aquifer has been collected in Paris for over a century. The first wells, drilled in 1841, have been replaced since 1996 by 5 new wells that are currently in service; they are in the same locations as the old wells and can be used as an emergency water source if needed. 3 of these wells are equipped with fountains that give local residents access to water that is rich in iron: the Verlaine fountain (13th District), the Lamartine fountain (16th District), and the La Madone fountain (18th District).

Were there to be a serious interruption of the water supply, these 5 wells would not be sufficient in their current state to meet the drinking-water needs of the entire population of Paris. That is why the City of Paris has received authorization to create 2 new emergency wells, in specific areas and for limited volumes. The Clichy-Batignolles eco-quarter well is among them.

Geothermal energy
to heat an eco-quarter in Paris

In 2002, the City of Paris decided to build an eco-quarter on railway wastelands in the 17th District that would serve as the emblem of sustainable urban planning in Paris. In 2012 the City of Paris and Paris Batignolles Aménagement (PBA), the planner-builder of Clichy-Batignolles, seeking a solution for producing renewable heat for heating and sanitary hot water for the future buildings in the eco-quarter, chose the project proposed by Eau de Paris. Structured around wells drilled into the Albian, the project combines heat production, emergency water, and a public fountain. The Albian conserves its principal function as a source of emergency water and of a public fountain, but in addition serves as a supply of energy via a geothermal doublet.

By providing heat for the eco-quarter beginning in late 2015, Eau de Paris, in partnership with the CPCU (Compagnie Parisienne de Chauffage Urbain, the Paris urban-heating provider), demonstrates its ability to become an actor in the energy transition.
The geothermal doublet: An efficient technique

One of the techniques used in geothermal heating is the geothermal doublet. This efficient process is being implemented in the Clichy-Batignolles eco-quarter.

It consists in creating 2 wells - one dedicated to extraction of hot water, and another whose function is to re-inject water into the aquifer after extraction of the calories contained in the water by means of a heat exchanger located at the surface.

The Albian: Renewable energy in the Île-de-France Region

The Île-de-France Region has committed itself, by 2020, to increase the number of equivalent housing units connected to the urban heating network by 40% and to double the production of heat from geothermal sources.

In that context, the Albian aquifer is doubly strategic. Deep geothermal – the leading source of production of renewable energy in the Île-de-France - consists in exploiting the heat naturally contained in the ground to produce electricity or heat.

Today, some thirty geothermal installations are in operation in the Region. They provide heat for homes, pools, hospitals, neighborhoods, etc. Most of these installations were put into service during the 1980s in response to oil-price shocks. But more recently, the Île-de-France Regional Council adopted a geothermal recovery plan which includes many new projects.

Geothermal:
“The leading source of production of renewable energy in the Île-de-France, geothermal consists in exploiting the heat naturally contained in the ground to produce electricity or heat.”
In 2015, energy and climate will have their summit in Paris.

Paris hosts the 21st Climate Conference in 2015

The Conference of the Parties (COP) brings together, every year, the “Parties” who are signatories of the UN Framework Convention on Climate Change (UNFCC), adopted in Rio in 1992. It is made up of 195 Party States and the European Union, which is itself a Party in addition to its 28 member States.

France will chair the 21st Climate Conference, to be held in Paris-Le Bourget, from 30 November to 11 December, 2015. 45,000 visitors are expected. This conference is of crucial importance. It must lead to a new international agreement on the climate that is applicable to all countries as of 2020.

The goal is to maintain global warming at less than 2°C in 2100 by applying the principle of differentiation. This agreement must follow on the Kyoto protocol, which was signed in 1997 and entered into force in 2005. Along with the definition of the new UN Millennium Development Goals at a United Nations summit in September 2015 and the Habitat III conference in 2016, it is one of the major stages in building the world of tomorrow.
And where does France fit in?

France has begun its environmental and energy transition with the goal of perceptibly reducing its carbon emissions. Even if France’s emissions of greenhouse-effect gases per inhabitant are already among the lowest in the developed countries, major efforts still need to be made, both in the area of energy sobriety and of renewable energy.

France is also working closely with the developing countries, via its aid to development, to foster transitions toward carbon-sober economies.

Within the European Union, France defends an ambitious position oriented towards a goal of a 40% reduction of emissions of greenhouse-effect gases by 2030, then a 60% reduction by 2040 (compared to 1990), so that the European Union can maintain an exemplary approach.

On the strength of that experience and that ambition, France was designated to host the COP 21 in 2015. The theme of the conference will be environmental exemplarity, and France will implement a program of action for reducing the impact of the meeting itself on consumption of natural resources (water, waste, energy) and greenhouse-gas emissions as much as possible.

Sources: French Ministry for Environment, Sustainable Development, and Energy
Let’s look farther ahead!

We are in 2100. The Paris Climate Protocol, signed in 2015 at the COP 21, has worked. The temperature in Paris has risen by 2°C, but no more.

What will Paris be like with a 2°C warmer temperature?

The city has actively transformed to struggle against runaway climate change and has used the opportunity to reinvent urban lifestyles. Long periods of drought alternate with brief periods of heavy rains. The very mild, rainy winters can no longer be distinguished from autumn.

In this reinvented Paris, the River Seine has become a vibrant public space, rooftops have become accessible, homes are acclimated, Parisians have returned to the streets, which had been taken over by automobiles, bicycles move smoothly along rapid paths, Métro stations have become open-air squares, farms have moved into the city... alternatives that are metamorphosing the urban environment.

Eau de Paris offers you a free re-interpretation of the project-fiction “Eau de Paris + 2 °C” by the ET ALORS architecture and urban research studio, which explores the role of water in Paris in the future in an inventive way. This is Eau de Paris’s way of raising Parisians’ awareness of the need to preserve water resources and drawing attention to the central role they play in the urban space today and tomorrow.
**Water** in the **Paris** of the **future**.

After the wave of relaxed strolls on the Paris aqueducts that cross the urban hinterlands and quietly bring in large quantities of water for consumption by Paris and its near suburbs, now the banks of the Seine are undergoing their revolution.

In this project-fiction*, the animals that cohabit with city dwellers have become full-fledged citizens. They move about without fear between the green spaces and the waters of the rivers. The banks of the Seine are popular spots for relaxation and leisure. The squares have become urban oases. The canals have been allowed to return to a natural state and have become places for swimming and contemplation.

*A free interpretation of the project-fiction “+ 2 °C Paris s’invente” by the ET ALORS architecture and urban research studio.

In this new landscape, water has found its place at the heart of urban space. Water recovery systems are installed at the tops of tall buildings. Rainwater is recovered and transformed for a variety of differentiated uses. Plants aid in the purification of runoff.

This reinvented, utopian Paris invites each of us to project our own desire for “sustainable living.” It challenges our conceptualizations and our relationship with water in the urban environment. Water management is no longer limited to the technical domain. Water is also a medium for self-realization. It is becoming a visible urban material that is helping improve the city by participating in improving the quality of life and of water use.

Dive into the animation and enter the city of tomorrow!
For 4 billion years, the history of our planet has been written with water, an essential resource that has never ceased to invent life, inspire artists, give rise to new beliefs, fire the enthusiasm of researchers and engineers, and give life to each and every one of us.

Since July 2010, after fifteen years of long debate, clean, healthful drinking water became a fundamental right, essential to the full enjoyment of the right to life. For even though it is an essential commodity, water is a source of injustice.

In 2015, access to water for all and the sharing of its uses will again be in the spotlight. Two international events will deal with the issue of water and climate change:

- the 7th World Water Forum in South Korea

Eau de Paris, the municipal agency in charge of production and distribution of water in Paris, is taking part in the process of adaptation to climate change.

- It initiates and promotes responsible projects thanks to reasonable and optimal use of water - collaboration with farmers to reduce the use of pesticides and nitrates; partnerships with lessors to install water-saving devices in apartments.

- It carries on actions in favor of access to water for everyone - a housing solidarity fund, deployment of public fountains.

- It innovates in projects that combine water and energy (geothermal or hydraulic) or encourage urban biodiversity (Blue and Green Plotting, biodiversity reservoirs in its natural spaces, including in urban environments).

- It encourages new usages of water by offering non-potable water as an alternative to potable water.

As an actor in the environmental transition, Eau de Paris, the Paris public water service, is reinventing the city of tomorrow for you thanks to the essential resource that is water.
Conception graphique : la Fabrique créative

L’eau. Un service public

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www.eaudeparis.fr