



CONSORTIUM ON REGIONAL **CLIMATOLOGY**  
AND **ADAPTATION** TO CLIMATE CHANGE



## OURANOS IN SHORT

2001

Ouranos is created by the Quebec government, Hydro-Québec and Environment Canada, with the financial support of Valorisation-Recherche-Québec

2004

An agreement expanding the number of members to 14 is signed

1st Ouranos scientific symposium is held

A five-year, \$14.25 M funding agreement is signed with the Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE)

2006

A strategic plan is prepared

2nd Ouranos scientific symposium is held

A Ouranos 2020 think tank is created

2007

Two new affiliated members are added

Ouranos prepares a 2009-2014 business plan

2008

The Quebec government announces a \$10 M grant to Ouranos for its impact and adaptation work

A new affiliated member is added



### STATUS

Private non-profit organization

### REGULAR AND AFFILIATED MEMBERS

17

### RESOURCES

- Network of some 250 scientists and professionals
- Total estimated resources of \$12 M/year
- Three CRAY-SX-6 supercomputers, with available calculation capacity of over 0.2 TFLOP and 725 terabytes of memory

### PROGRAMS

10

### PROJECTS

Over 40

### APPROACH

Based on a participatory, partnership philosophy

### CONCERNS

- Public safety and secure infrastructures
- Energy supply
- Water resources
- Health
- Forestry, agricultural, mining, tourism and transportation operations
- Protecting the natural environment

### POSITIONING

- Acts jointly with many Quebec and cross-Canada organizations
- Works in Quebec, across Canada and on the international scene
- Assumes responsibility for Canadian regional climate simulations
- Is the main source of North American regional climate simulations

## BACKGROUND

Ouranos was created in 2001 as a joint initiative by the Quebec government, Hydro-Québec and Environment Canada, with the financial support of Valorisation-Recherche-Québec. The goal was to provide Quebec and all of Canada with an organization capable of meshing climate science with the needs of different sectors of society in adapting to expected climate change.

Since it was founded, Ouranos has innovated by bringing together researchers in different disciplines and conducting integrated research projects, combining the development of regional climate forecasts and the assessment of physical and human impacts related to climate change.

2004 was a banner year, as an agreement was signed expanding the number of member to 14, including 8 government departments and 4 universities. On May 6, 2004, Ouranos signed a five-year, \$14.25 million funding agreement with the Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE).

Three affiliated members joined the team in 2007 and 2008, illustrating Ouranos' drawing power.

Finally, in 2008 the Quebec government announced that Ouranos would receive a \$10 million grant to conduct adaptation R&D projects.

Ouranos is now entering a new phase in its evolution, with a planning horizon extending to 2020. The goal is to both consolidate and expand its activities on the national and international scenes.



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→ **DID YOU KNOW?** OURANOS WAS A GOD OF GREEK MYTHOLOGY, REPRESENTING THE SKY. HE WAS THE FIRST GREEK GOD, BORN FROM CHAOS, AND FATHERED MANY CHILDREN WITH GAIA, THE EARTH GODDESS. THEIR CHILDREN SYMBOLIZED THE FUNDAMENTAL ELEMENTS: MOUNTAINS, VOLCANOES AND OCEANS. THE MYTH OF OURANOS HELPED THE GREEKS UNDERSTAND HOW THE SKY INTERACTED WITH THE EARTH AND ITS INFLUENCE ON HUMANS.

## MISSION

The mission of Ouranos is to acquire and develop knowledge on climate change, its impact and related socioeconomic and environmental vulnerabilities, in order to inform decision makers about probable climate trends and advise them on identifying, assessing, promoting and implementing local and regional adaptation strategies.



## VISION

To make Ouranos a national and international leader in multidisciplinary scientific research on regional climatology and, with its partners, a leader in vulnerability and impact assessment and in developing strategies and decision-making tools for adapting to climate change, in a sustainable development context.

## VALUES

### ***Excellence***

Integrity, work quality and scientific rigour

### ***Relevance and usefulness***

Meet members and society's needs and expectations

### ***Integration***

Promote staff development and participation and transparent management policies

### ***Leading by example***

Illustrate the partnership approach at the national and international levels, through relevant, high-quality actions

### ***Openness***

Foster multidisciplinary work both internally and with the community as a whole



## CONTEXT

A broad international scientific consensus has emerged to the effect that human activities are contributing to climate change and that global warming is accelerating. Recent reports by the Intergovernmental Panel on Climate Change (IPCC) have endorsed this consensus.

Along with these changes, we are seeing increased wider climate fluctuations and a higher frequency of some extreme weather events. Major meteorological events that have struck Quebec in the past 12 years, in particular the Saguenay flood in July 1996 and the ice storm in January 1998, have focused attention on society's vulnerability to such disasters.

If they are to prepare appropriate adaptation strategies, decision-makers must have accurate information on the nature, extent and rapidity of the expected regional impacts of climate change.

To date, although there are many climate models available on a global scale, there are few regional models and scenarios, and the local repercussions of climate change are poorly understood. A variety of information is required, calling for a multidisciplinary approach that draws on climate expertise and an assessment of physical and human impacts.

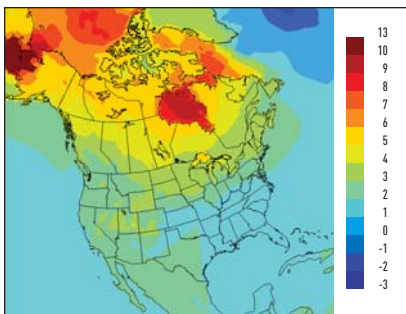
In this context, Ouranos can perform a very valuable role.

→ **DID YOU KNOW?** A SINGLE CLIMATE SIMULATION FOR NORTH AMERICA OVER A 30-YEAR TIME FRAME, AT A RESOLUTION OF 45 KM, TAKES OVER 3 MONTHS TO EXECUTE AND GENERATES UPWARDS OF 2.5 TERABYTES OF DATA (2,500 BILLION BYTES)? AND THAT IS WITH OUR CRAY/SX6 SUPERCOMPUTERS, PERFORMING NEARLY 2.5 BILLION MATHEMATICAL OPERATIONS PER SECOND!

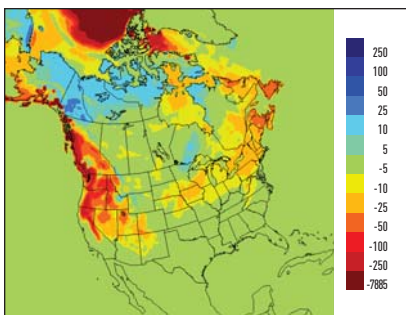


## CLIMATE CHANGE

(CRCM SIMULATION, 2041-2070 MINUS 1961-1990)



TEMPERATURE AT 2M ABOVE GROUND, DEG. C



SNOWFALL, CM

## ISSUES

Ouranos establishes its work objectives on the basis of issues and needs expressed by its members and government departments and institutions in Quebec and across Canada.

Over the coming decade, Ouranos will endeavour to identify the impacts of climate change in the following fields:

- Public safety and secure infrastructures
- Energy supply
- Water resources
- Health
- Forestry, agricultural, mining, tourism and transportation operations
- Protecting the natural environment

It will also address the following, complementary issues:

- Arctic populations and ecosystems
- Development of northern resources in Quebec and across Canada
- Northwest Passage
- Water management in the Great Lakes/St. Lawrence system

## ORIENTATIONS

To respond to these issues, Ouranos intends to:

- Improve climate forecasts and better identify associated uncertainties.
- More accurately quantify the extent of impacts and vulnerabilities and risks related to extreme events.
- Enhance and significantly step up its analysis of adaptation options.



Ouranos is a consortium that brings together some 250 scientists and professionals from different disciplines. It focuses on two main themes:

Climate sciences

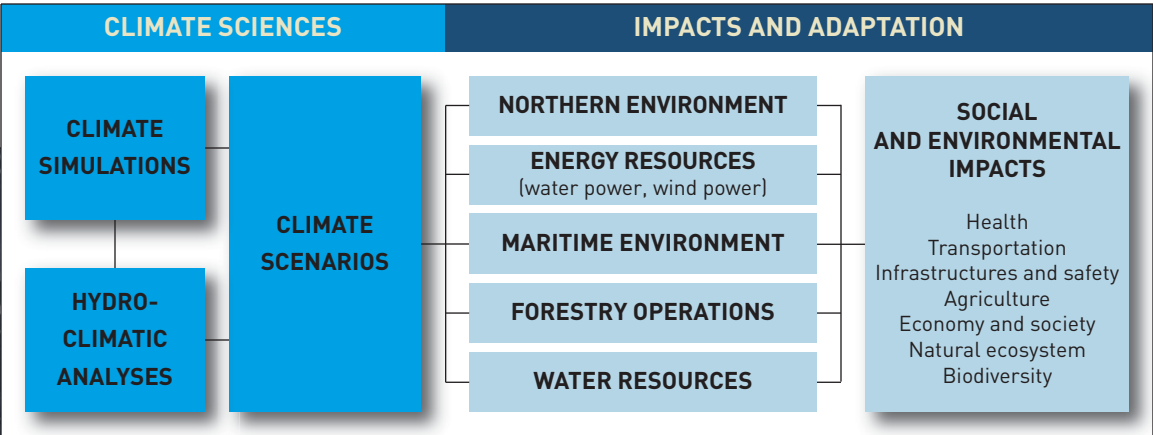
- Developing knowledge.
- Providing the simulation data and climate scenarios required for impact and adaptation studies.
- Processing and validating the results obtained through relevant and adequate hydro-climatic analyses.

These functions are broken down into three groups: climate simulations, climate scenarios and hydro-climatic analyses.

Impacts and adaptation

- Evaluating the impacts of climate change on the environment, the public and socio-economic activity.
- Assessing the vulnerabilities of systems.
- Identifying and recommending to decision-makers the best approaches for adapting to climate change.

Many thematic programs are included in a single "Impacts and Adaptation" group.

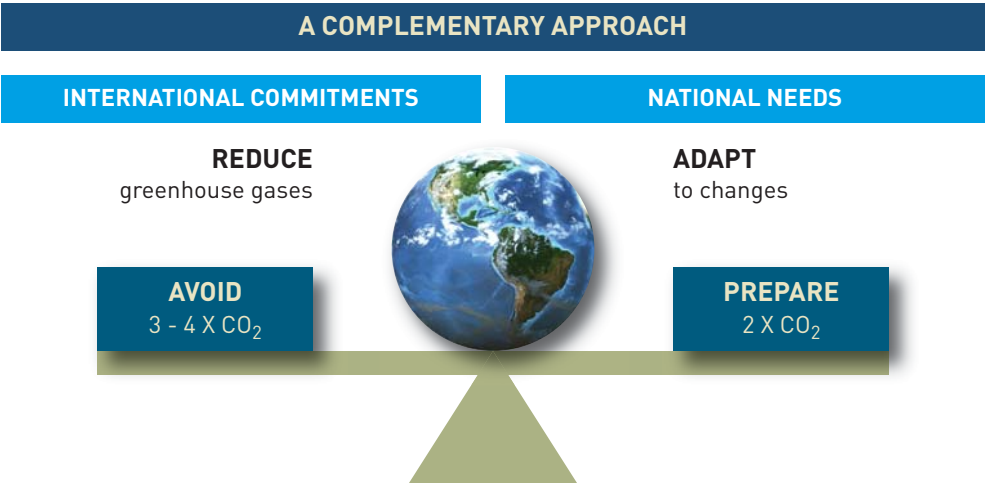


INTERNATIONAL DYNAMICS

Confronted with the dilemma of climate change, society must reduce its greenhouse gas emissions but also prepare itself to adapt to this new reality.

This complementary approach is sure to lead to better management of the impacts related to this phenomenon.

Ouranos focuses on ways of adapting to climate change.



→ **DID YOU KNOW?** SOME IMPACTS RELATED TO CLIMATE CHANGE CAN BE POSITIVE. IN QUEBEC, ENERGY CONSUMPTION IS EXPECTED TO SHRINK OVER THE COMING DECADES, SINCE THE INCREASE GENERATED BY AIR CONDITIONING NEEDS IS LIKELY TO BE LESS THAN THE DECLINE IN ENERGY DEMAND FOR HEATING!

### 14 regular members

Quebec government:

- Ministère de la Sécurité publique
- Ministère du Développement durable, de l'Environnement et des Parcs
- Ministère des Ressources naturelles et de la Faune
- Ministère des Affaires municipales et des Régions
- Ministère des Transports du Québec
- Ministère de l'Agriculture, des Pêcheries et de l'Alimentation
- Ministère du Développement économique, de l'Innovation et de l'Exportation
- Ministère de la Santé et des Services sociaux

Hydro-Québec

Environnement Canada

Université du Québec à Montréal (UQAM)

Université Laval

McGill University

Institut national de la recherche scientifique (INRS)

### 3 affiliated members

École de technologie supérieure (ÉTS)

Manitoba Hydro

Université du Québec à Rimouski (UQAR)

and many scientific partners





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