# Annual Report

**ICES** 



## **About ICES**

# Population-based health research that makes a difference

ICES leads cutting-edge studies that evaluate health care delivery and population outcomes. ICES researchers access a vast and secure array of Ontario's demographic and health-related data, including population-based health surveys, anonymous patient records, as well as clinical and administrative databases. ICES is recognized as an international leader in maintaining the privacy and security of personal health information.

### **World-class research teams**

ICES is a community of research, data and clinical experts. Many ICES scientists are internationally recognized, and a number are practicing clinicians who understand the everyday challenges of health care delivery. They lead multidisciplinary teams that include expert statisticians and epidemiologists, as well as specialists in knowledge translation, information security and information technology. The diversity within these teams and their expertise at using ICES' outstanding array of linked data sets is the foundation of the innovative approach to research at ICES.

### Our impact

ICES research results in an evidence base that is published as atlases, investigative reports and peer-reviewed papers, and is used to guide decision-making and inform changes in health care policy and delivery. Many ICES reports are undertaken to answer specific questions (known as Applied Health Research Questions) posed by health system stakeholders and policy makers. ICES research influences the design, implementation and evaluation of health policy and the delivery of health care. ICES atlases and reports are highly regarded in Canada and abroad.

### Independence

As an independent not-for-profit corporation, ICES takes pride in its international reputation as a trusted, impartial and credible source of high-quality health and health services research and evidence. ICES receives core funding from the Ontario Ministry of Health and Long-Term Care. ICES scientists and staff have highly successful track records competing for peer-reviewed grants from federal agencies, such as the Canadian Institutes of Health Research, and from provincial and international funding bodies.

### A growing network across Ontario

ICES Central is located on the campus of Sunnybrook Health Sciences Centre in Toronto. It has physical satellite sites at Queen's University in Kingston (ICES Queen's), the University of Ottawa (ICES uOttawa), the University of Toronto (ICES UofT), Western University in London (ICES Western), McMaster University in Hamilton (ICES McMaster), and the Health Sciences North Research Institute in Sudbury in partnership with Laurentian University and the Northern Ontario School of Medicine (ICES North).

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# Letter from the CEO

Our annual report provides an opportunity to take stock of the outputs and impact of ICES scientists and staff over the past year, and celebrate other achievements of the organization as a whole. This was the first full year of our three-year strategic plan, and we were successful in achieving our goals for the year.

Our research productivity surpassed all previous milestones with the publication of 492 peer-reviewed papers – a 26-year record for ICES and a 13% increase from 2016/17 – and the launch of 428 new research projects, a 31% year-over-year increase. Our scientists continued to demonstrate a striking research grant application success rate, with more than one in three ICES applications submitted to the Canadian Institutes of Health Research receiving funding.



We also made good progress on data science as a research priority at ICES with 33 papers published on topics related to this area. We implemented an advanced statistical methods educational initiative to promote the use of data science methods to our scientists and staff. In addition, we launched the Ontario Data Safe Haven (ODSH), developed jointly by ICES, Compute Ontario and High Performance Computing for Health (HPC4H). The ODSH provides ICES scientists and others with a high-performance computing environment for health data storage, linkage, analysis and access.

During this highly productive period, we developed an enhanced partnership framework, executing fresh collaborations and service agreements with key provincial partners, including Health Quality Ontario and Cancer Care Ontario. With an eye on the future, we have strengthened our collaborations with Ontario's artificial intelligence leader, the Vector Institute. ICES sustained ongoing partnerships with Immigration, Refugees and Citizenship Canada and with the Ontario ministries of Education, Children and Youth Services, and Community and Social Services around new and expanded cross-sectoral data. We formed new collaborations with national and international partners, including the

Canadian Network for Observational Drug Effect Studies (CNODES), the Pan-Canadian Real-world Health Data Network, and the University of Melbourne.

We have advanced our commitment to Indigenous health research, building out the ICES Indigenous Portfolio and extending our relationships with Indigenous communities and leadership organizations. A highlight of the year for me, along with many ICES staff and researchers, was participating in a land-based training exercise on Manitoulin Island as a guest of the Anishinaabe people. We gained a greater understanding of the rich history and culture of some of our Indigenous community partners and their views on health, data and research and how these are relevant to their lives.

Given our role as an enabler for the research community, ICES has developed a more client-focused delivery model for the services we provide to researchers outside of ICES, including making increasingly varied data more readily accessible. We've made strides to maximize the satisfaction of health system knowledge users who access the Applied Health Research Question and Data and Analytic Services that ICES offers.

We continue to provide value to the people of Ontario, delivering on our complex mandate efficiently and within budget, making smart internal investments in staff and infrastructure to sustain operational success in the long term, and securing additional funding partners for priority areas.

Scientists and staff at the seven ICES sites across the province are proud of the positive impact our research findings have had on the health system and services, but we are most proud of the impact they can have on the health of the people of Ontario. We've shared some key examples of that impact in this report. We'll have many more stories in the years to come as new and compelling research studies – relevantly informed by public engagement – provide actionable insights that improve lives.

Dr. Michael Schull

# **Board of Directors**

April 1, 2017 to March 31, 2018



#### Dr. Catherine Zahn

President and CEO, CAMH

### **Directors**

#### Mr. Matthew Anderson

President and CEO, Lakeridge Health

#### Ms. Anne C. Corbett

Partner, Borden Ladner Gervais LLP

#### Dr. Colleen M. Flood<sup>1</sup>

Director, Centre for Health Law, Policy and Ethics, and Canada Research Chair in Health Law and Policy, University of Ottawa

#### Ms. Laura Formusa

Former President and CEO, Hydro One Inc.

### Mr. Murray R. Glendining<sup>1</sup>

President and CEO, London Health Sciences Centre

#### Dr. Harriet MacMillan

Chedoke Health Chair in Child Psychiatry and Professor, Department of Psychiatry and Behavioural Neurosciences and Department of Pediatrics, McMaster University

### Mr. Geoffrey Rowan

Independent communication consultant

### Ms. Kathy Watts

Former VP Finance and CFO, Hamilton Health Sciences

### Mr. Dev Chopra<sup>2</sup>

Principal, CJEM Advisory Services Inc.

### Dr. Roger Strasser<sup>2</sup>

Dean, Northern Ontario School of Medicine

<sup>1</sup> Retired from Board in June 2017

<sup>2</sup> Joined Board in June 2017

# 2017/18 Year in Numbers

### **Our People**

496 scientists and staff (6% increase from 2016/17)



253 staff (5% increase from 2016/17)



44%

of ICES scientists work from satellite sites

37%

of research staff work from satellites sites

489

graduate students and postgraduate trainees mentored by ICES scientists 178

graduate students accessing ICES data



### **Research Capacity**



7 research programs

91 data holdings

166 a

new data sharing agreements executed



10

primary data collection studies involving 29 hospitals 62

new awards, including salary support and scientific achievement, received by ICES scientists



37%

overall grant success rate on 207 grant submissions



### **Knowledge Generation**

new projects initiated (31% increase from 2016/17)

1,013 ongoing projects (22% increase from 2016/17)

peer-reviewed publications (13% increase from 2016/17)

had at least one ICES stat member as a co-author



6
ICES atlases and reports



55

new Applied Health Research Question (AHRQ)\* requests from 39 unique knowledge users — exceeds annual target of 25 set by the MOHLTC 53 completed AHRQ requests

117

requests to ICES Data & Analytic Services (DAS) — more than double the annual target of 40 set by the OSSU

### **Knowledge Translation**



increase in visits to the ICES website

(20% of visitors from outside of Canada)

news releases (87% media uptake)

media hits per month on average

(4,365 total)



58% of media coverage was international

9,385 Twitter followers (22% increase from 2016/17)



presentations by ICES scientists and trainees

(36% international)

\*An AHRQ is a question posed by a health system policymaker or provider – a knowledge user – to obtain research evidence that informs planning, policy or program development that will benefit the entire Ontario health system.

# Research with Impact

A selection of recent projects that illustrate the combination of clinical insight and scientific rigour driving ICES research.



Assessing the appropriateness of cardiovascular screening and care



Innovating algorithms for high-impact research on brain disorders



Evaluating emergency department wait times and quality of care



Supporting Indigenousled population health research in Ontario



Enabling planners and providers to track mental health care and outcomes over time

### **Stronger Health System**

ICES research has improved the quality of Ontario cardiovascular screening and care, leading to better care at a lower cost.

### The Problem

Cardiovascular illnesses drive some of Ontario's highest health system costs, with heart disease and stroke being among the leading causes of death. As more people age with risk factors that call for early detection and treatment, the practice of screening for cardiovascular diseases has become more widespread and costly. ICES research has shown that in 2009 Ontario spent \$130 million on echocardiograms alone. But are Ontarians getting better care for these higher costs?

### The Research

Key to the work of ICES' Cardiovascular Research Program is the population-level evaluation of access, outcomes and costs associated with cardiovascular and stroke care, including testing. By linking large data sets that include claims data and outcomes, ICES scientists are able to assess population-level appropriateness of diagnostic testing, thereby helping to identify targets for savings in one of the most costly domains of health care delivery.

### **Recent Impact**

- A 2013 ICES study showed an 82% rise in the use of echocardiography in Ontario between 2001 and 2009, with a quarter of these tests done as repeat procedures. The findings helped to shape new echocardiography standards and billing requirements made mandatory by the Ontario government in 2016.
- A 2015 ICES study revealed a 30-fold variation in cardiac testing before low-risk surgeries. This finding contributed to the introduction of new guidelines by the Canadian Cardiovascular Society, the Canadian Society of Internal Medicine and the Canadian Anesthesiologists' Society and to updated Choosing Wisely recommendations.
- A 2017 ICES study showed that the implementation of appropriate use criteria for cardiac imaging in 2009 was associated with a reduction in the use of myocardial perfusion imaging, with almost 90,000 fewer scans performed at a cost savings of \$72 million over seven years. The study team will next look at whether this reduction in imaging has affected patient outcomes.

"Cardiovascular illnesses represent a heavy burden in Ontario, both in terms of years of life lost and costs to the health care system. The robust data we hold and analyze at ICES shows where we get good value for our money, where we are underperforming, and where we have opportunities to reduce the use of unnecessary or inappropriate procedures."

#### **Douglas Lee**

Senior Scientist and Lead, Cardiovascular Research Program

### **Impact Highlights**



Helped to shape new Ontario billing requirements and standards for the more appropriate use of echocardiography.



Contributed to **new guidelines and recommendations** on
cardiac testing before
low-risk surgeries.



Showed that appropriate use criteria for cardiac imaging resulted in **large health system cost savings**.

#### DEFEDENCES

Blecker et al. ACC Cardiovasc Imaging (2013). Duceppe et al. Can J Cardiol (2017). Kirkham et al. CMAJ (2015). Roifman et al. JAHA (2018).

### **Better Policy**

A novel ICES-developed methodology provides the foundation to support Ontario's dementia strategy and local health system planning.

### The Problem

Brain disorders are an important public health concern in Canada, affecting one in three people in our lifetimes. Given the advancing age of the Ontario population, health planners have more need than ever for reliable data on the prevalence of brain disorders, particularly Alzheimer's and related dementias.

### The Research

To improve health care planning with reliable provincespecific data, ICES partnered with the Ontario Brain Institute in 2014 to identify the prevalence, incidence and health system costs of several types of brain disorders.

The research was conducted by scientists in ICES' Health System Planning and Evaluation Research Program. The team applied custom algorithms to filter the records of more than 20 million patients to reliably identify people with brain disorders and track them into the future.

### Recent Impact

- This work, which was foundational to Ontario's dementia capacity planning project, was undertaken in partnership with Cancer Care Ontario and the Ontario Brain Institute. It used ICES data and algorithms for a system capacity model developed for the Ministry of Health and Long-Term Care.
- The team's work continues to support the provincial dementia strategy through requests for additional data related to service use and costs, and through regional reports for local health planners.
- The algorithms continue to be adapted by ICES scientists and others for peer-reviewed Canadian and international research, including a much-cited paper in *The Lancet* exploring the impact of pollution on the incidence of dementia and other diseases.

### **Impact Highlights**



**First real-world data** on the prevalence of brain disorders in Ontario.



Ongoing supply of data and analysis for Ontario's dementia strategy and regional service planning.



Algorithms continue to be adapted for high-impact research on brain disorders.

"This project is a good example of the way ICES shares our novel methodologies broadly through our networks, teaching external researchers and planners to use linked administrative data to answer important health policy questions."

#### Susan Bronskill

Senior Scientist and Lead, Health System Planning and Evaluation Research Program

#### REFERENCES

Bronskill et al. Brain Disorders in Ontario: Prevalence, Incidence and Costs from Health Administrative Data (2015). Chen et al. Lancet (2017).

### **Stronger Health System**

ICES is helping to improve wait times, lengths of stay and quality of care in Ontario's emergency departments.

### The Problem

Patients in emergency departments (EDs) in Ontario, as in many jurisdictions, often experience long wait times. Long waits in EDs and hallways not only create discomfort and distress for the patients and their families, but they can be dangerous. A 2011 ICES study showed that each additional hour a patient spent waiting in the ED was associated with an increased risk of hospitalization or death. In response, Ontario introduced a multifaceted strategy to reduce wait times, and ICES scientists were asked to evaluate its effectiveness.

### The Research

ICES research has been influential, both in Canada and internationally, in pioneering new methodologies for emergency services quality improvement research, including evidence on wait times, quality of care, outcomes, and care following ED discharge. ICES research also provides evidence to answer specific questions from the Ontario Ministry of Health and Long-Term Care and other stakeholders about the Ontario Wait Times Strategy.

### **Recent Impact**

ICES research is guiding policy and efforts in the field to improve the quality of emergency health services. A series of peer-reviewed ICES papers published in 2014–2016 demonstrate that:

- Achievement of wait time targets is associated with lower risk of death or hospitalization, supporting Ontario's specific wait time targets;
- A hospital pay-for-performance program led to modest ED wait time improvements, providing evidence for an ongoing policy incentive;
- A hospital lean intervention was not associated with improved ED waits, providing evidence to end this program; and
- Other ED care quality measures did not improve with shorter wait times, supporting efforts by hospitals and organizations such as Health Quality Ontario to implement other quality improvement programs in addition to tackling wait times.

"Timely, high-quality emergency care is a fundamental expectation of our health system. This requires policies that are informed by evidence, including actionable targets so we can measure progress and identify where there is none. The powerful linked data and sophisticated methodology at ICES are vital to the province's ongoing effort to improve care for Ontarians."

#### Michael Schull

CEO and Senior Scientist, Health System Planning and Evaluation Research Program

### **Impact Highlights**



### **Real-world evaluation** of

Ontario's Wait Times Strategy to assess effects of programs as they are implemented, with findings including:



**Positive effect** of specific wait time targets on reducing risk.



**Moderate effect** of

pay-for-peformance on reducing wait times.



**No effect** of lean intervention on reducing wait times.



**No effect** of reduced wait times on other measures of ED care quality.

#### REFERENCES

Guttmann et al. BMJ (2011). Schull et al. CJEM (2015). Vermeulen et al. Ann Emerg Med (2014). Vermeulen et al. Ann Emerg Med (2015). Vermeulen et al. BMJ Qual Saf (2016).

### **Better Policy**

ICES is working with First Nations, Inuit and Métis partners across Ontario to apply principles of Indigenous data sovereignty and forge a path to Indigenous-led population health research.

### The Problem

Data about the health of Indigenous (First Nations, Inuit and Métis) people in Canada have historically been produced, stored and used without regard for the sovereignty of those data within Indigenous populations. The recognition of Indigenous data sovereignty is in accordance with the rights set out in the UN Declaration on the Rights of Indigenous Peoples, necessary to the calls to action from the Truth and Reconciliation Commission of Canada, and fundamental to the OCAP® Principles for First Nations research. But until now, data about health services use have not been accessible to Ontario's Indigenous peoples.

### The Research

ICES has worked closely for several years with diverse Indigenous partners to develop unique data governance and data sharing agreements for Indigenous-driven analyses using administrative health data. In October 2017, ICES formalized an Indigenous Portfolio with dedicated staff, a scientific lead and a network of scientists.

The portfolio works with Indigenous partners, including the Chiefs of Ontario and the Métis Nation of Ontario, and

with other research institutes. Applying a decolonized lens and using Indigenous models of well-being, the team works with communities to build internal research capacity by training Indigenous researchers. It also collaborates with international researchers to advance the emerging field of Indigenous data sovereignty.

### Recent Impact

- Creation of unique data governance agreements guided by principles of Indigenous sovereignty, using novel methods for data linkage. These advances make possible, for the first time, Indigenous-driven population health research using linked administrative health data. The data now include the largest First Nations cohort in Canada, at 200,000 people.
- Publication of an internationally collaborative paper in *The Lancet* in 2017 detailing the conditions of Indigenous data sovereignty in Canada, Australia and New Zealand.
- Partnering with First Nations groups on two CIHR grants, and continuing to respond to the data needs of First Nations communities, health units and the Chiefs of Ontario.

"Indigenous data governance and engagement are nuanced and complex. Consistently underpinning our work are our key guiding principles and supporting processes, which include ethical relationships, formalized data governance agreements, appropriate methodology and approaches guided by Indigenous perspectives, and models of well-being."

#### Jennifer Walker

Scientist and Lead, Indigenous Portfolio

### **Impact Highlights**



Novel data governance agreements guided by Indigenous data sovereignty principles, enabling data linkage for Indigenous-led population health research.



Work with national and international partners to advance the emerging field of Indigenous data sovereignty.



Multiple grants, studies, and partner-led analyses underway within a year of launching the Indigenous Portfolio.

REFERENCE Walker et al. Lancet (2017).

### **Healthier People**

ICES has produced the first Ontario-wide mental health and addictions scorecards on services for children, youth and adults, enabling planners and providers to measure and respond to the growing need for care.

### The Problem

Mental health and addictions services in Ontario have long been known to be fragmented and lacking coordination and accountability. But the full extent of the problem has been impossible to quantify, much less fix, without system-wide, cross-sector measurement.

### The Research

In addition to publishing dozens of peer-reviewed papers each year, ICES' Mental Health and Addictions Research Program produces its keystone Mental Health and Addictions Scorecard and Evaluation Framework (MHASEF) report every two years.

Partnerships underway in 2017/18 include a collaborative report with the Toronto Central Local Health Integration Network that looked at the needs of and care trajectories for the clients of over 100 community providers. The program is also consulting on the development of a provincial sector-wide scorecard and a mental health and addictions sector data strategy that is now underway.

### **Recent Impact**

- The MHASEF reports provide system-wide standardized performance mental health and addictions indicators for all child/youth and adult populations across Ontario, a first in Canada.
- These ICES-developed indicators have been adopted for similar measurement in other Canadian jurisdictions, with ICES leading a five-province performance measurement indicator project and consulting on work at the Canadian Institute for Health Information to further define indicators and diagnostic groups.
- The program continues to work with multiple Ontario ministries and service agencies to produce data and analyses that make it possible to benchmark and target performance improvements, whether locally or across sectors, as part of Ontario's mental health and addictions strategy.

"Largely due to stigma, we've never before been able to meaningfully evaluate or plan for mental health and addictions services in Ontario. With this new capacity to collect and analyze data across sectors, we can finally move past unaccountable service siloes into a future that holds the promise of a coherent and efficient system available to all people who need care."

#### Paul Kurdyak

Senior Scientist and Lead, Mental Health and Addictions Research Program

### **Impact Highlights**



The first system-wide, standardized performance indicators for the mental health sector in Canada.



An ICES-led **five-province collaboration** that is defining indicators for national comparisons.



Ongoing scorecards that enable planners and providers across the mental health sector to **track care** and outcomes over time.

#### DEFEDENCES

MHASEF Research Team. The Mental Health of Children and Youth in Ontario: 2017 Scorecard (2017). MHASEF Research Team. Mental Health and Addictions System Performance in Ontario: A Baseline Scorecard (2018).

# Financial Report

# Statement of Financial Position

### As at March 31, 2018

(in thousands of dollars)						
	GENERAL FUND		RESTRICTED FUND		TOTAL	
	2018	2017	2018	2017	2018	2017
	\$	\$	\$	\$	\$	\$
ASSETS						
Current assets						
Cash	2,666	3,962	7,263	6,103	9,929	10,065
Short-term investments	_	_	505	_	505	_
Accounts receivable	2,475	2,680	156	1,017	2,631	3,697
Prepaid expenses	627	563	11	54	638	617
	5,768	7,205	7,935	7,174	13,703	14,379
Long-term investments	2,128	_	_	_	2,128	_
Tangible capital assets	1,658	1,813	_	_	1,658	1,813
	9,554	9,018	7,935	7,174	17,489	16,192
LIABILITIES						
Current liabilities						
Accounts payable and accrued liabilities	2,025	3,316	9	9	2,034	3,325
Due to Ministry of Health and Long-Term Care	_	_	333	331	333	331
Deposit in trust	2,841	1,930	_	_	2,841	1,930
Due to Sunnybrook Health Sciences Centre	356	367	_	_	356	367
Deferred lease liability	186	239	_	_	186	239
	5,408	5,852	342	340	5,750	6,192
Post-employment benefits other than pensions	880	763	_	_	880	763
Deferred capital grant	1,658	1,813	_	_	1,658	1,813
Deferred operating grants	868	309	7,593	6,834	8,461	7,143
	8,814	8,737	7,935	7,174	16,749	15,911
NET ASSETS			'		'	
General fund	740	281	-	_	740	281
	9,554	9,018	7,935	7,174	17,489	16,192

# Statement of Operations and Changes in Net Assets

### For the year ended March 31, 2018

(in thousands of dollars)						
	GENERAL FUND		RESTRICTED FUND		TOTAL	
	2018	2017	2018	2017	2018	2017
	\$	\$	\$	\$	\$	\$
REVENUE						
${\sf Grants-Ministry}\ {\sf of}\ {\sf Health}\ {\sf and}\ {\sf Long-Term}\ {\sf Care}$	8,613	6,228	_	_	8,613	6,228
Interest income	52	71	_	_	52	71
Other revenue	8,629	7,884	_	_	8,629	7,884
Amortization of deferred capital grant	530	425	_	_	530	425
Amortization of deferred operating grants	-	1,270	7,384	7,629	7,384	8,899
	17,824	15,878	7,384	7,629	25,208	23,507
EXPENDITURES						
Employee costs	13,928	12,723	6,208	6,862	20,136	19,585
Contracted services	205	417	25	14	230	431
Information, technology and security	723	338	640	605	1,363	943
Office and general	726	618	107	78	833	696
Amortization of tangible capital assets	530	425	_	_	530	425
Professional fees	174	293	404	70	578	363
Premises	1,068	1,064	_	_	1,068	1,064
	17,354	15,878	7,384	7,629	24,738	23,507
EXCESS OF REVENUES OVER EXPENDITURES FOR THE YEAR	470	-	_	_	470	_
NET ASSETS — BEGINNING OF YEAR	281	_	_	_	281	_
REMEASUREMENTS OF DEFINED BENEFIT PLANS	(11)	281			(11)	281
NET ASSETS — END OF YEAR	740	281	_		740	281

# Statement of Cash Flows

### For the year ended March 31, 2018

(in thousands of dollars)

GENERAL FUND		RESTRICTED FUND		TOTAL	
2018	2017	2018	2017	2018	2017
\$	\$	\$	\$	\$	\$
470	_	_	_	470	_
105	97	_	_	105	97
(530)	(425)	_	_	(530)	(425)
_	(1,270)	(7,384)	(7,629)	(7,384)	(8,899)
577	1,443	(1,395)	49	(818)	1,492
530	425	_	_	530	425
(28)	_	(5)	_	(33)	_
(9)	_	_	_	(9)	_
(303)	1,440	906	(1,583)	603	(143)
812	1,710	(7,878)	(9,163)	(7,066)	(7,453)
376	1,515	_	_	376	1,515
(384)	(1,515)	_	_	(384)	(1,515)
(2,100)	_	(500)	_	(2,600)	_
(2,108)	_	(500)	_	(2,608)	-
_	_	9,541	7,609	9,541	7,609
_	_	(3)	(412)	(3)	(412)
	_	9,538	7,197	9,538	7,197
(1.296)	1.710	1.160	(1.966)	(136)	(256)
3,962	2,252	6,103	8,069	10,065	10,321
	2018 \$ 470 105 (530) 577 530 (28) (9) (303) 812  376 (384) (2,100) (2,108)  (1,296)	2018   2017	2018   2017   2018	2018   2017   2018   2017     2018     2017     5   5   5   5   5   5   5   5   5	2018   2017   2018   2017   2018   5   5   5   5   5   5   5   5   5

# Contact Us

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Phone: 705-523-7151

### **ICES Queen's**

Abramsky Hall, Room 208, 21 Arch Street, Kingston, Ontario K7L 3N6 Phone: 613-533-6936

#### **ICES UofT**

155 College Street, Suite 424, Toronto, Ontario M5T 3M6 Phone: 416-978-5203

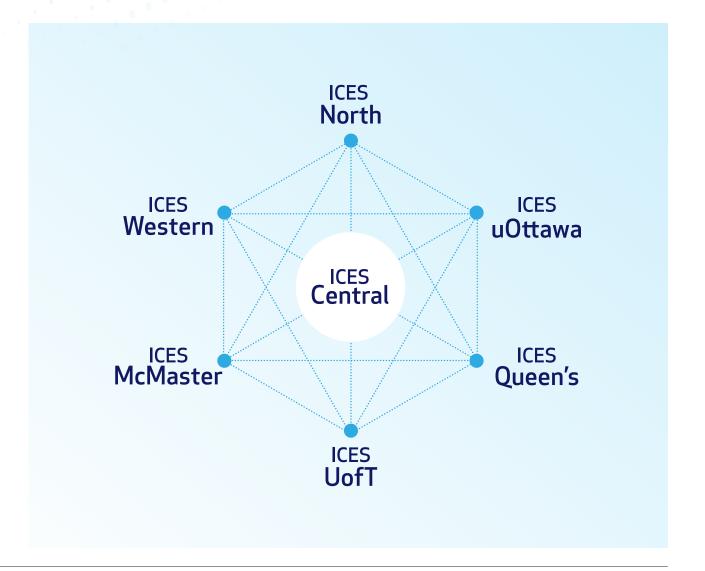
#### ICES uOttawa

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ices.on.ca

