



IMPC Program Management

Integrated Modelling Program (IMPC) kick-off workshop

National Hydrology Research Centre

14-16 September 2017, Saskatoon, SK



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INTEGRATED MODELLING
PROGRAM FOR CANADA

Outline

- Project Management
- Annual Workshops & Meetings
- Important Dates & Deadlines
- Individual Plans
- Website



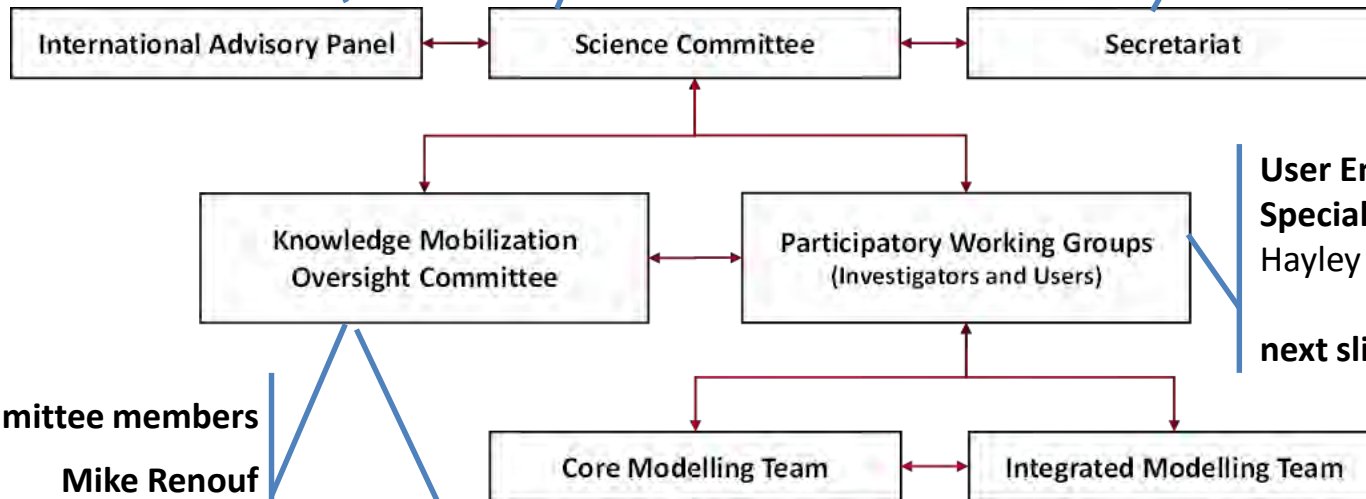
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Project Management

Eric Wood (Princeton U)
Hoshin Gupta (U Arizona)
Steven Chapra (Tufts U)
Casey Brown (U Mass.Amherst)
Thorsten Wagener (U of Bristol)
Patrick Reed (Cornell U)

Saman Razavi
Al Pietroniro
Howard Wheeler
Pat Gober
John Pomeroy

Program Manager:
Amin Haghnegahdar
Data Manager:
Branko Zdravkovic
GIWS admin. staff



User Engagement Specialist
Hayley Carlson
next slides ...

Committee members

Mike Renouf
Prairie Provinces Water Board

Wayne Jenkinson
International Joint Commission

Bob Holliday
Partners for Saskatchewan River Basin

Knowledge Mobilization Specialist
Stephanie Merrill



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Participatory Working Groups: Investigators

1. Roy Brouwer (U of Waterloo)
2. Paulin Coulibaly (McMaster U)
3. Amin Elshorbagy (UofS)
4. Pat Gober (UofS)
5. Carl Gutwin (UofS)
6. Tim Jardine (UofS)
7. Yanping Li (UofS)
8. Karl Lindenschmidt (UofS)
9. Al Pietroniro (UofS)
10. John Pomeroy (UofS)
11. Saman Razavi (U of Manitoba)
12. Tricia Stadnyk (U of Manitoba)
13. Graham Strickert (UofS)
14. Bryan Tolson (U of Waterloo)
15. Howard Wheeler (UofS)



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Participatory Working Groups: Users/Collaborators

1. Arsenault (Rio Tinto, Jonquière)
2. Asadzadeh (U of Manitoba)
3. Baulch (UofS)
4. Curry & Baird (Canadian Rivers Institute, U of New Brunswick)
5. Davison (Environment and Climate Change Canada, National Hydrology Research Center, Saskatoon)
6. Faramarzi (U of Alberta)
7. Fortin (Environment and Climate Change Canada, Canadian Meteorological Centre, Dorval)
8. Frigo (City of Calgary)
9. Hallborg (Saskatchewan Water Security Agency)
10. Halliday (Partners for the Saskatchewan River Basin, Saskatoon)
11. Howard (Agriculture and Agri-Food Canada, Regina)
12. Isaak (Chief Executive Officer, Meewasin Valley Authority).
13. Janowicz (Yukon Environment, Whitehorse)
14. Jenkinson (International Joint Commission, Ottawa)
15. Koenig (Manitoba Hydro, Winnipeg)

16. Luo (Manitoba Infrastructure, Winnipeg)
17. MacKenzie (The Saskatchewan River Delta Stewardship)
18. McKay (The Northern Village of Cumberland House)
19. Melton (Environment and Climate Change Canada - Climate Processes Section, Victoria)
20. Neil Mochnacz (Fisheries and Oceans Canada, Winnipeg)
21. Parker (Parks Canada, Tobermory)
22. Peters (Environment and Climate Change Canada, Victoria, BC)
23. Pittman (Mackenzie River Basin Board, Yellowknife)
24. Renouf (Prairie Provinces Water Board, Regina)
25. Spiteri (UofS)
26. Tang (Alberta Environment and Parks, Calgary)
27. Taylor (Parks Canada, Banff)
28. Tollefson (Agriculture and Agri-Food Canada, Regina)
29. Weber (BC Hydro, Barnaby)



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Participating Representatives

Laurie Tollefson	Agriculture and Agri-Food Canada
Bernard Trevor	Alberta Environment & Parks
Khaled Akhtar	Alberta Environment & Parks
Muluneh Mekonnen	Alberta Environment & Parks
Tom Tang	Alberta Environment & Parks
Andrew Huang	City of Calgary
Sandy Davis	City of Calgary
Bruce Davison	Environment and Climate Change Canada
Daniel Peters	Environment and Climate Change Canada
Vincent Fortin	Environment and Climate Change Canada
Lyndon Gyurek	EPCOR Water
Wayne Jenkinson	International Joint Commission
Kevin Gawne	Manitoba Hydro
Fisaha Unduche	Manitoba Infrastructure and Transportation
Mike Renouf	Prairie Provinces Water Board
Curtis Hallborg	Water Security Agency
John-Mark Davies	Water Security Agency
Richard Janowicz	Yukon Department of Environment



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Annual Workshops & Meetings

1. Kick-off workshop (Sep. 2017)
 - *current status, inception report, planning*
2. 1st annual meeting (end of year 1, July 2018?)
 - *Progress, interim results and plan, interim report*
3. 2nd annual meeting (end of year 2, July 2019?)
 - *Progress, interim results and report, plan to complete*
4. 3rd annual meeting (end of year 3, July 2020?)
 - *Summary and final report, plan for phase 2 under GWF*



Meetings & conference calls by sub-groups

- Every 3 months for each Theme
 - Led by Theme leads
 - To check on progress & planning
 - Sep 15, Dec. 15, Mar.15, June 15?
- Other meetings for each WP as needed
 - Led by WP leader(s)
- Report date & outcomes to program manager

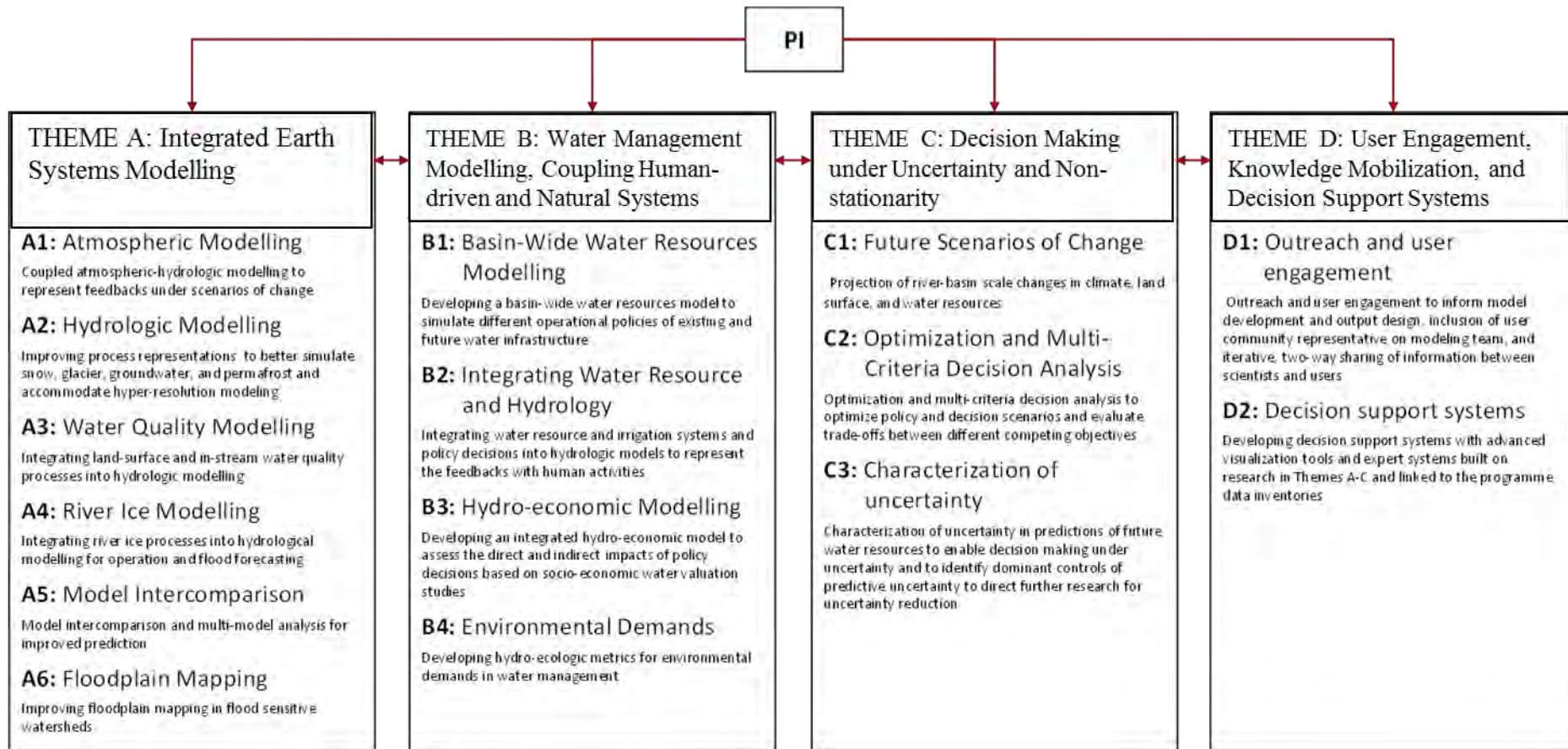


Important Dates & Deadlines

- Release of the funding will be contingent upon **satisfactory progress** (determined by the Science Committee)
- **Bi-annual reports due**
 1. *15 March 2018*
 2. *15 September 2018*
 3. *15 March 2019*
 4. *15 September 2019*
 5. *15 March 2020*
 6. *15 July 2020*



IMPC Themes



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Initial Project Deliverables and Timelines

	2017	2018	2019	2020
(A1) High Resolution Atmospheric Modelling				
Historical & Future Climate Scenarios WRF & RCMs for Nelson-Churchill, Mackenzie, Great-Lakes St. Lawrence, and Yukon River Basins.				
Preliminary evaluation of land atmosphere feedbacks for Nelson-Churchill, Mackenzie, Great-Lakes St. Lawrence, and Yukon River Basins.				
(A2) Improving Hydrological Process Representation				
Glacier, perennial snow and lowland pond components added to MESH				
Impact of glaciers on runoff under climate change				
Impact of depressional storage on runoff under climate change				
(A3) Integrating land-surface and in-stream water quality				
steady state model using the SPARROW model				
A new large basin-scale water quality modelling toolkit linked to MESH				
Open loop simulations of long-term climate change				
(A4) Integrating river ice processes into hydrological modelling (MESH)				
Developing Integrated river ice-hydrology model for improved ice jam for Red River and Porcupine River				
Forecasting and climate change impacts assessment including the Nelson-Churchill and Mackenzie basins.				
(A5) Hydrologic model inter-comparison and multi-model analysis for improved prediction				
Comparing MESH, VIC, and GEM-HYDRO in the Great Lakes basin				
Comparing MESH, CRHM, HYPE, VIC, and in the Nelson-Churchill river basin				
(A6) Improving floodplain mapping				
Modelling tools for flood risk assessment in the Prairies and Great Lakes under climate and landscape changes				
Tools for current and future flood quantile estimation at gauged and ungauged sites using advanced statistical methods (Nelson and Great Lakes basins)				
(A7) Characterization of model uncertainty				
Tools and results for uncertainty and sensitivity analysis of the different models developed in the programme in different basins.				
Estimates on uncertainty in models' results (water quality and quantity) to feed Theme C				

	2017	2018	2019	2020
(B1) Developing a water resources model				
Water resources model developed, tested and deployed for Nelson-Churchill RB				
Management model integrated with models of B2 & B3				
Scenario runs and results of guided by Theme C				
(B2) Developing a performance model for aquatic ecosystems				
The aquatic ecosystem performance model developed, tested, and deployed for Northern Rivers and deltas in Nelson-Churchill and Mackenzie River Basins				
(B3) Developing an integrated hydro-economic model				
The hydro-economic model developed, tested, and deployed the Great Lakes and Nelson-Churchill basins				
(C1) Future scenario generation for river-basin scale changes in climate, land surface, and water resources				
Policy-relevant scenarios of change in climate, land surface, and quantity and quality of water resources for Nelson-Churchill River Basin, Mackenzie River Basin				
(C2) Optimization and multi-criteria decision analysis				
Decision options and trade-offs for a range of decision making problems involving a range of stakeholders and users. Focus on Nelson-Churchill RB.				
Similar work will begin for Mackenzie, Great-Lakes St. Lawrence, and BC RBs, as appropriate				
(D1) Outreach and user engagement				
Social scientific research, knowledge mobilization, social learning, and place-based case studies				
(D2) Developing decision support systems with advanced visualization tools and expert systems				
Visualization and Mobile Decision Theater				

2017 2018 2019 2020

(B1) Developing a water resources model



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Individual Working Plans

- Initial WPs sent out
- To be verified/confirmed by co-Is before the IMPC workshop
- Modified during the workshop
- A modified/confirmed version to be sent out after the workshop



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Website

gwf.usask.ca/impc



Global Water Futures > IMPC

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IMPC

Integrated Modelling for Prediction and Management of Change in Canada's Major River Basins

Part of Global Water Futures



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Overview

IMPC aims to provide an integrated platform for forecasting, prediction and decision making under uncertainty to address outstanding local- to national-scale challenges for the current and future quality and quantity of water in Canada's major river basins. It provides a new paradigm for model development, integrated water management, and user engagement in Canada by integrating atmospheric science, hydrology and ecology with social science, computer science, economics, and water resource engineering, to build on and extend the core [Global Water Futures \(GWF\)](#) modelling, data, and knowledge mobilisation capabilities.

IMPC received \$1.65 million from GWF and is among the 12 initial research projects across Canada who successfully received nearly \$16.9 million in total from [GWF](#) over the next three years (until August 2020) to tackle some of Canada's most pressing water-related challenges. With



IMPC workshop

14-15 Sep. 2017

**Integrated Modelling for Prediction and Management of
Change in Canada's Major River Basins**



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