

# Climate-Related Precipitation Extremes

Global Water Futures Inception Meeting  
Wilfrid Laurier University  
Jan. 21-23, 2018

# Motivation

Our users/partners need new insights into the **future occurrence** of:

- Drought
- Summer precipitation including hail
- Freezing rain, snow

# Objectives

- Support planning for and adapting to the environmental, health and economic **impacts** of identified critical climate-related precipitation extremes
- Provide in-depth insights into climate and climate modelling issues



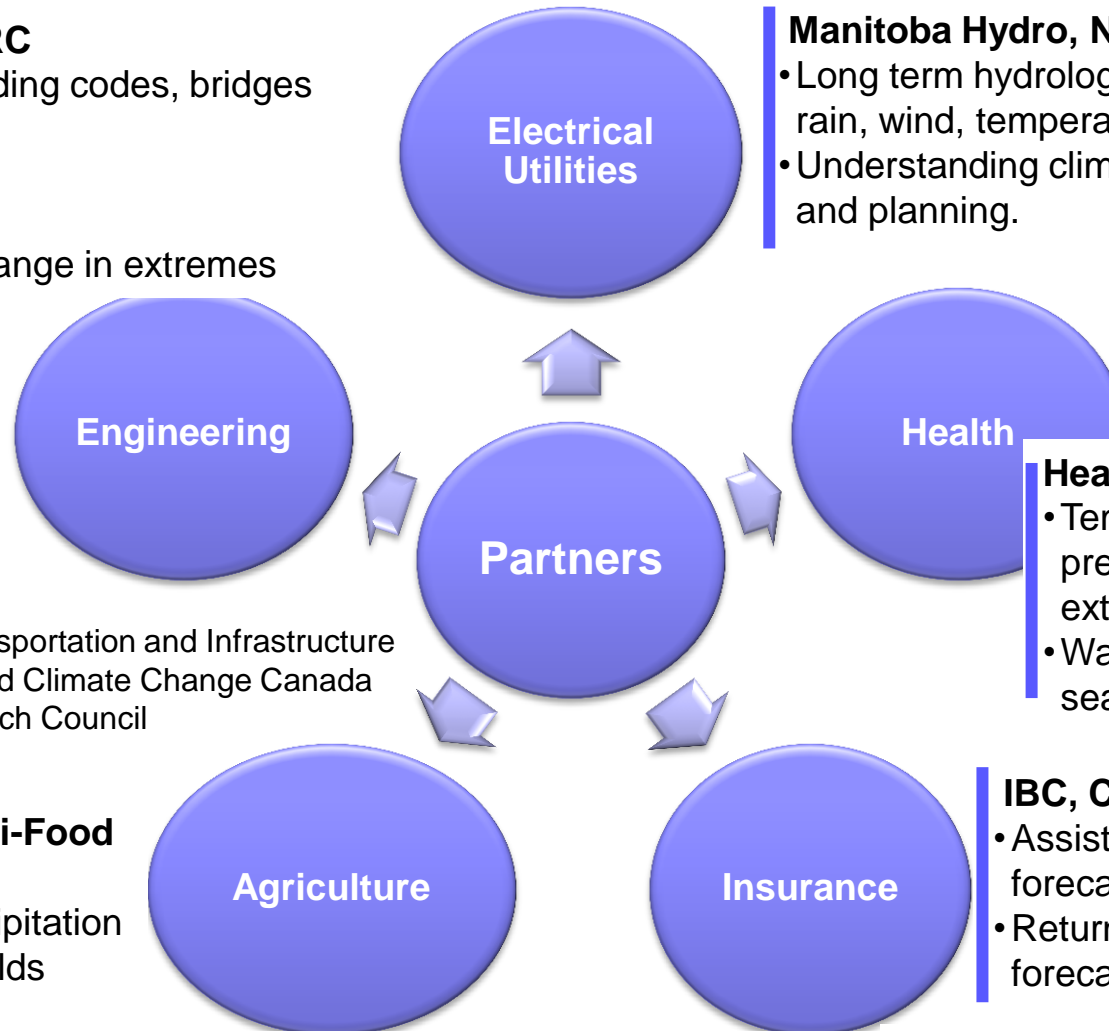
# Users/Partners

## BC MoTI, ECCC, NRC

- Implications for building codes, bridges codes, standards,...
- Return periods
- Non-stationarity
- Projecting future change in extremes

## Manitoba Hydro, NB Power, BC Hydro

- Long term hydrological drought, freezing rain, wind, temperature extremes
- Understanding climate change, adapting and planning.



## Health Canada

- Temperature and precipitation-related extremes
- Water-borne diseases, seasonality and shifts

## IBC, CIA, ICLR, CatIQ

- Assistance in incorporating forecasts into pricing models
- Return periods and short term forecasts

**BC MoTI:** Ministry of Transportation and Infrastructure  
**ECCC** : Environment and Climate Change Canada  
**NRC** : National Research Council

## Agriculture and Agri-Food Canada, CCME









Impact of future precipitation extremes on crop yields

**CCME:** Canadian Council of Ministers of the Environment

**IBC** : Insurance Bureau of Canada  
**CIA** : Canadian Institute of Actuaries  
**ICLR** : Institute of Catastrophic Loss Reduction  
**CatIQ:** Catastrophe Indices and Quantification Inc

# Project Status

Project Status - Jan 22, 2018

Task	Status
Funds for year 1	
Information Manager and Project / Knowledge Mobilization Manager recruitment	
Web site configuration	
HQP recruitment	
'Kick Off' Meeting': Updating user needs, Presenting past and current relevant research as well as initial plans for research	
Inception meeting in Waterloo (now)	
Inception report: Draft including short/long-term plans, contributions by specific co-investigators, collaborators and teams,...	
GWF Science workshop in June 4-6, 2018 at McMaster University	

 Fully achieved

 In progress

 Not yet achieved

# Current activities and future plans

- Tasks needed for modelling droughts and cold/warm season precipitation:
  - Examine past critical events identified by partners/users;
  - Acquire relevant observational and associated information;
  - Assess capability of high resolution models to simulate events (Weather Research and Forecasting model, WRF);
  - Use existing GCM and RCM information to provide initial assessments of future occurrences;
- Prepare for new WRF simulations driven by climate scenario (lake ice model, variables to archive, data storage);
- Review/update climatic data in consultation with partners and stakeholders;
- Reinforce/develop links with users and key GWF projects/ GWF Cores (Pillars1 & 3).

# Links to other GWF projects

## Pillar 1

## Pillar 3

## Core Teams

Understanding the  
underpinning  
physical processes

Other GWF  
projects

Short-Duration  
Extreme Precipitation  
in Future Climate

Storms and  
Precipitation Across  
the continental Divide  
Experiment

Climate-Related  
Precipitation Extremes

Mountain Water  
Futures

Knowledge  
Mobilization  
(interactions users-  
project researchers)

Modelling  
(WRF, prediction)

Data Management  
(observational  
data, model  
outputs)

# Project Network

## University Investigators

**John Hanesiak**  
**Mary Kelly**  
**Yanping Li**  
**Ronald Stewart**  
**Julie Theriault**  
**Francis Zwiers**

## Collaborators/Users

**Ahmed Attar**  
**Barrie Bonsal**  
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**Bob Kochtubajda**  
**Zoubir Lounis**  
**Scott MacRitchie\***  
**David McGown**  
**Harry Moss\***  
**Lawrence Mudryk**  
**Budong Qian**  
**Roy Rasmussen**  
**Jim Samms**  
**Laura Twidle\***  
**Mike Vieira**  
**Elaine Wheaton**  
**Anna Yusa**  
**Xuebin Zhang**

## KM Advisors

**David Greenall**  
**Al Howard**  
**Kristina Koenig**  
**Dirk Nyland**  
**Dan Sandink**  
**John Scinocca**

\*: Partners who have recently joined the project