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Water in the World We Want: *Water & Climate Security in a Warming World*

*A Presentation by
R.W. Sandford
EPCOR Chair, Water Security
United Nations University
Institute for Water, Environment & Health*



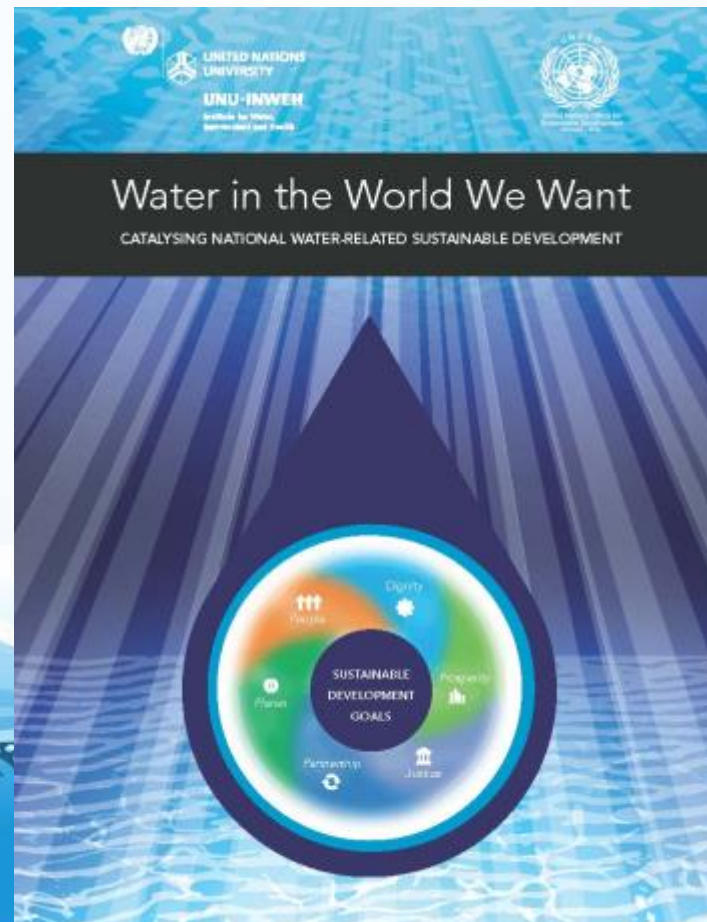


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Water Security: The UN post-2015 sustainable development goals













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The silence around the silence with respect to climate change

*International Workshop on
Communicating the Science and Impacts
of Fundamental Earth System Change
.....A Focus on Ice-Snow-Water*

*The World Bank, Washington DC
12-14 November 2014*

*International Organizing Committee
Charles Vorösmarty, Páll A. Davíðsson, Magdalena
Muir, Robert Sandford and Darlene Dube*

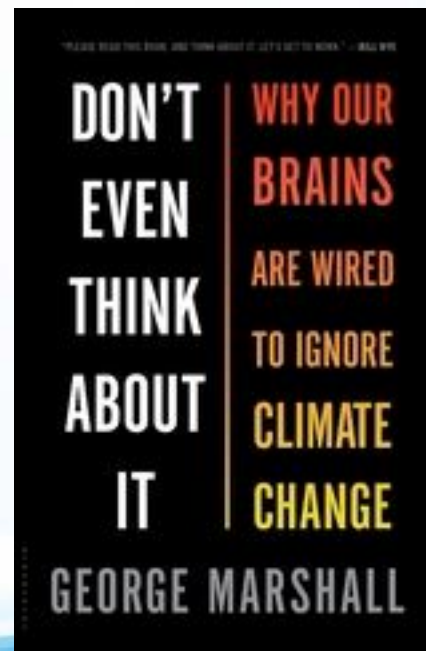


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Follow the Water: Water & Climate Security are Inseparable





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Water & Climate Security: Follow the water



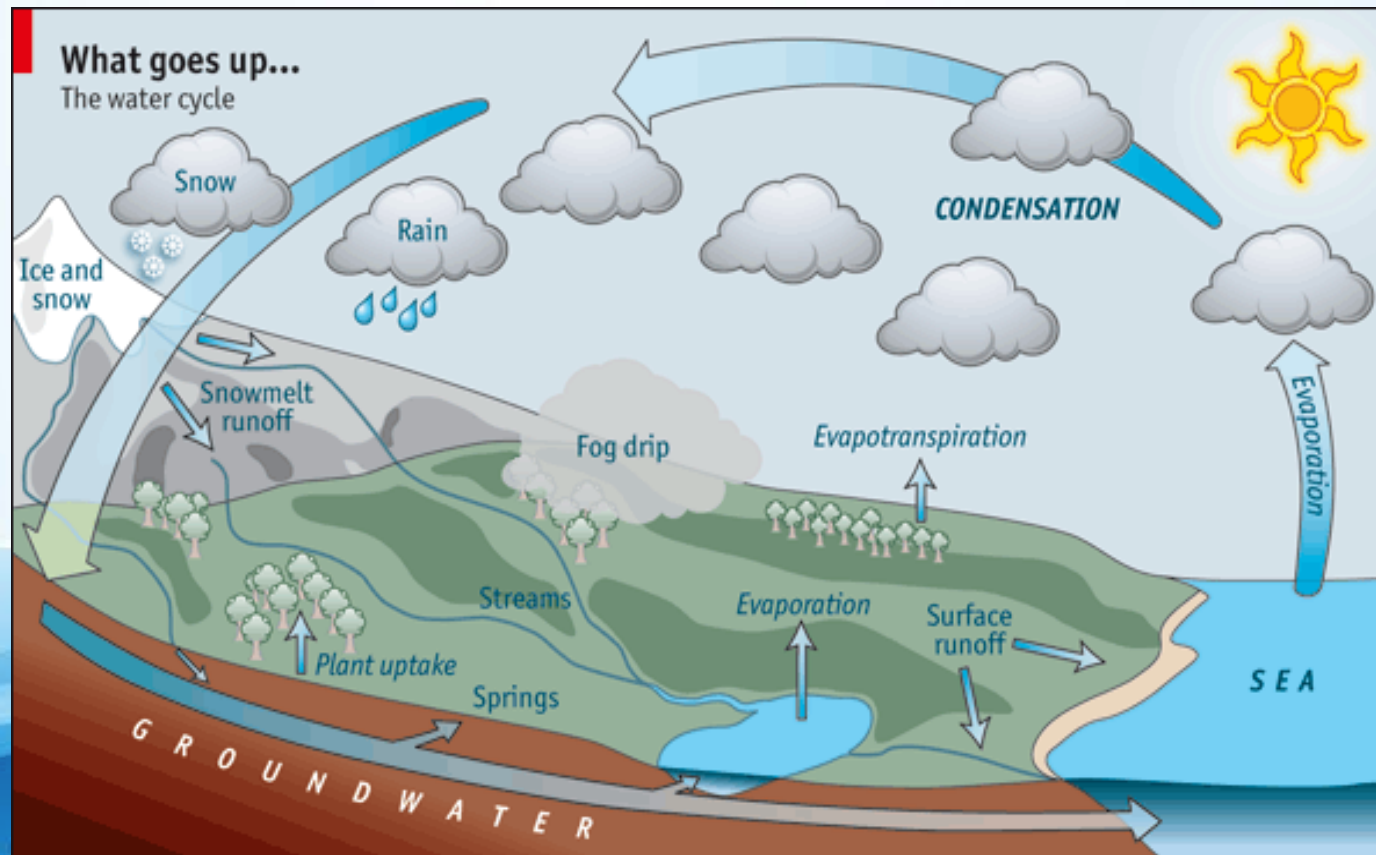


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Connecting the Dots: The real urgency resides in recognizing that our nation's hydrology is changing.



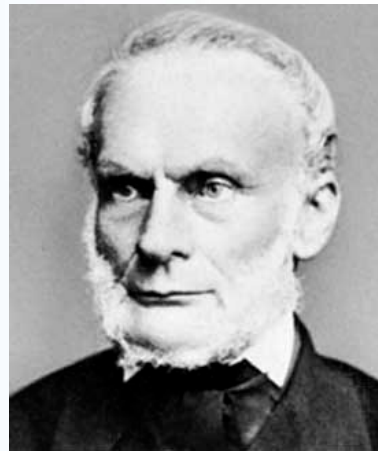


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The Clausius-Clapyron Relation

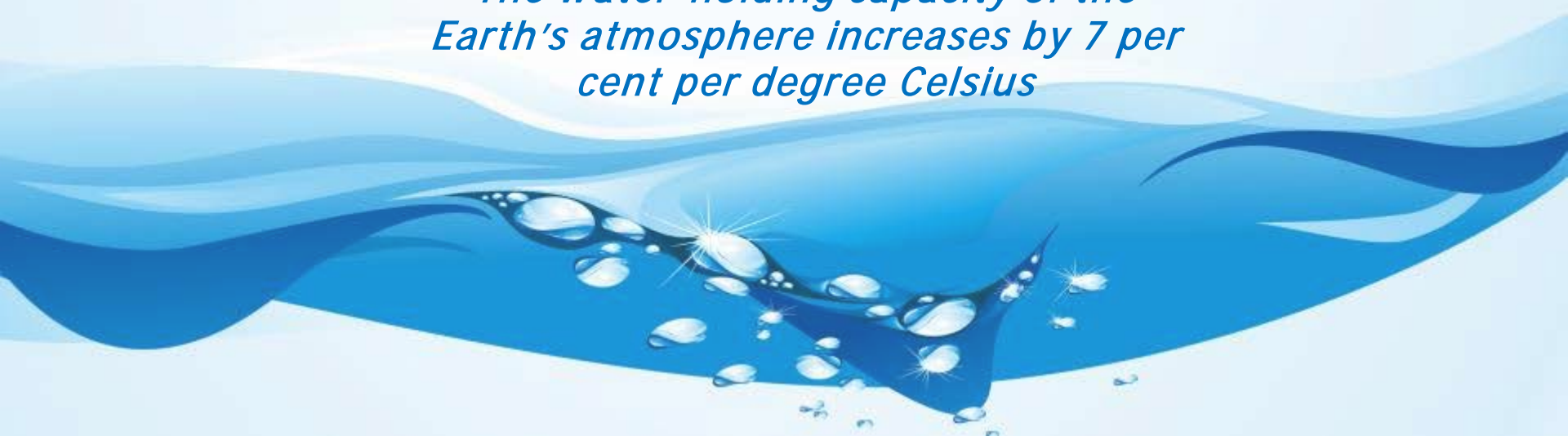


Rudolf Clausius



Benoit Clapeyron

*The water-holding capacity of the
Earth's atmosphere increases by 7 per
cent per degree Celsius*



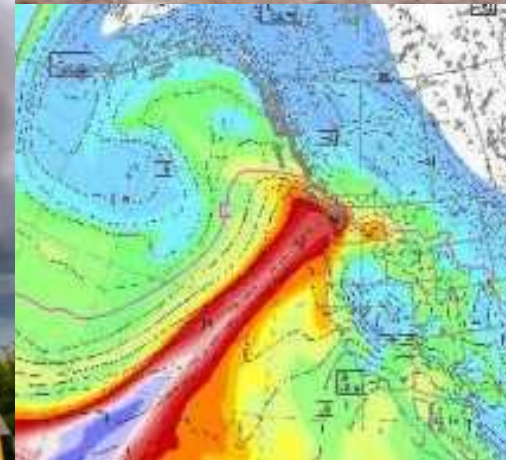
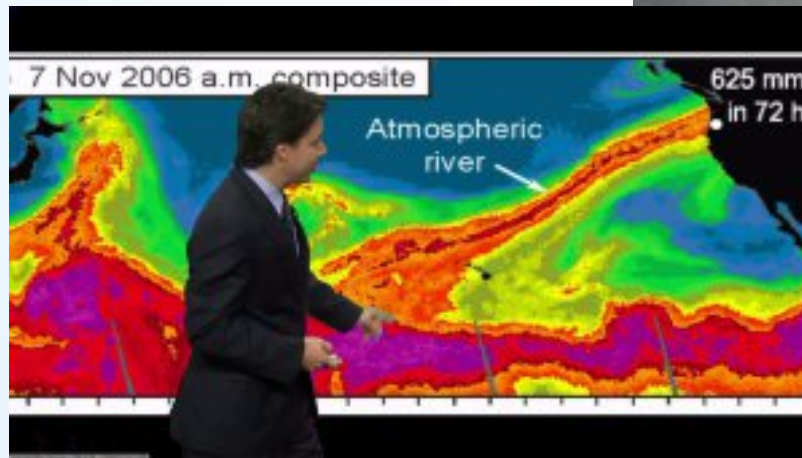


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Atmospheric Rivers



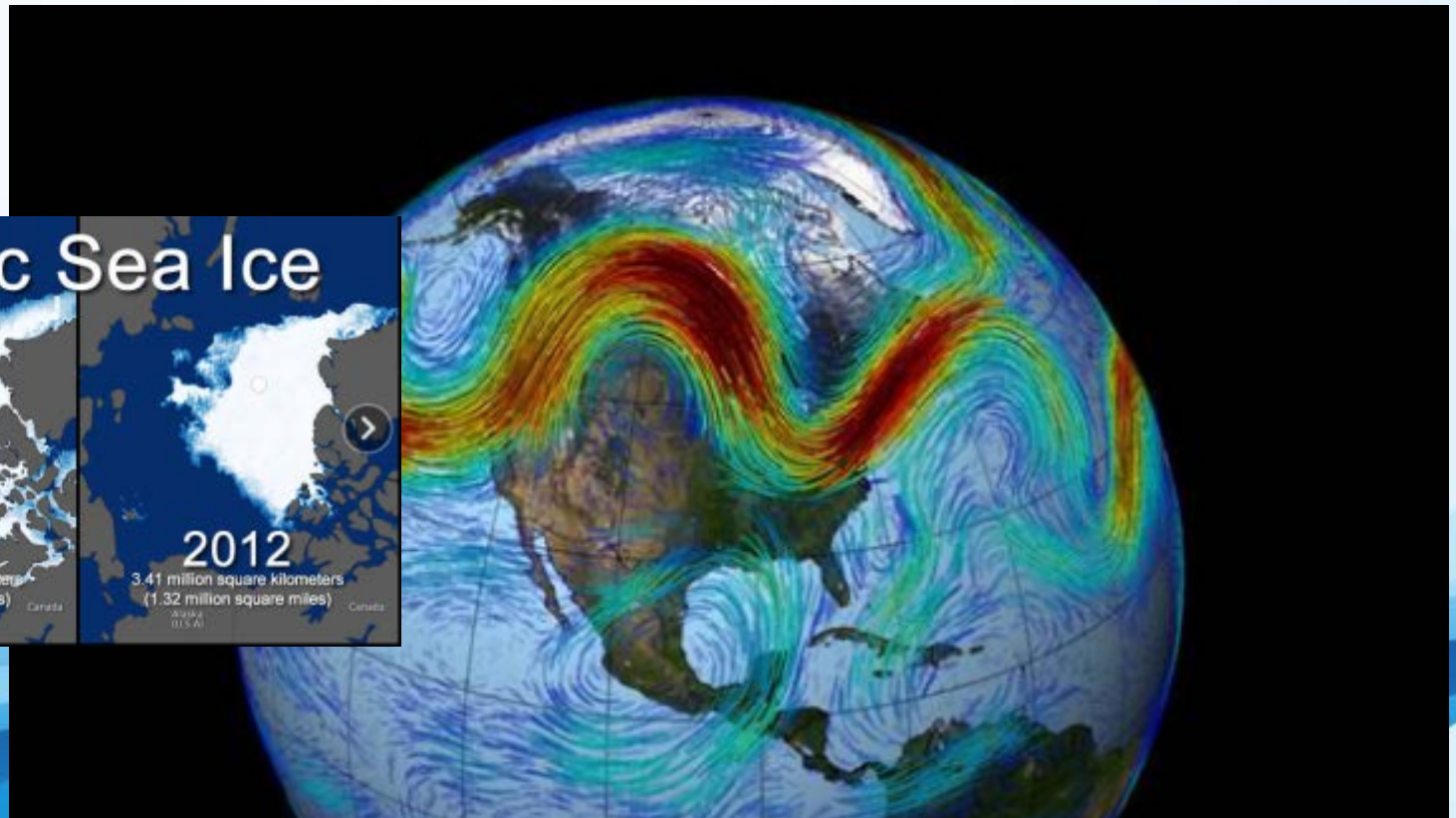


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What we know scientifically: The loss of Arctic sea ice appears to be causing the jet stream to meander.



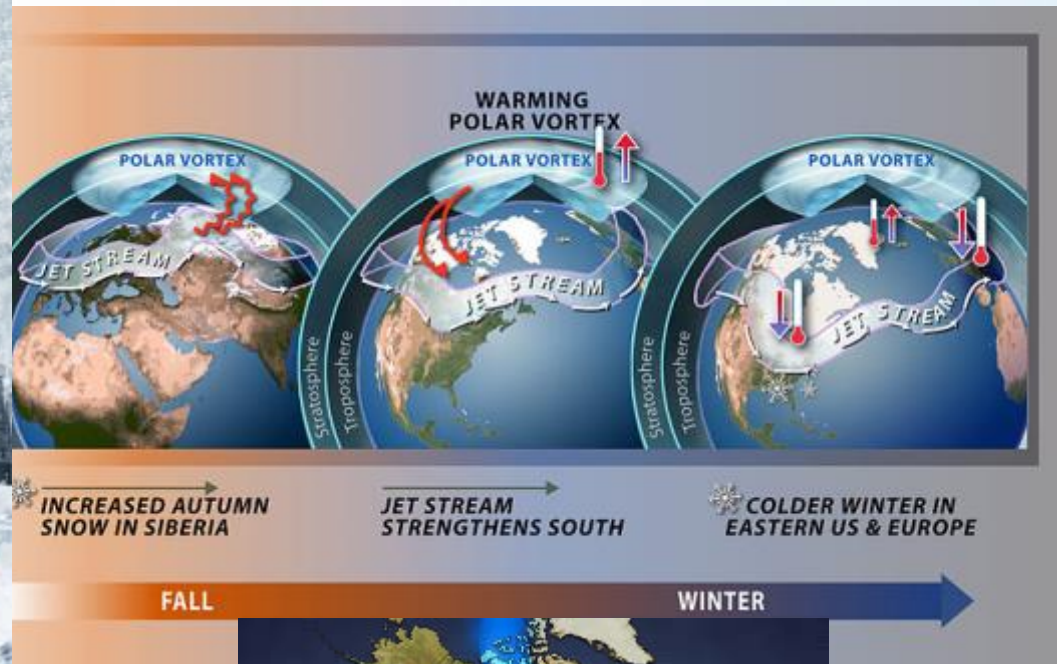
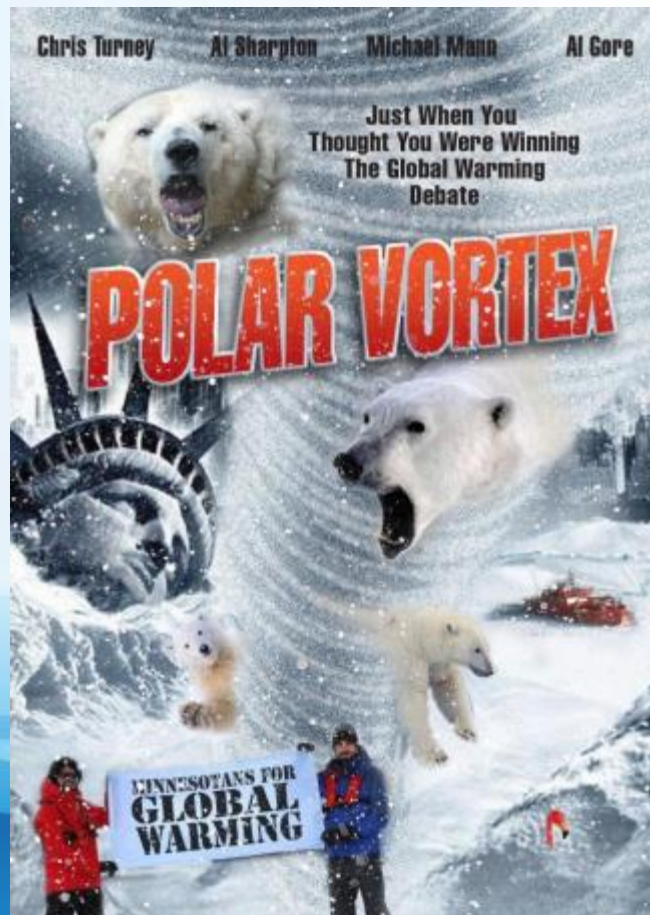


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The Polar Vortex





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Follow the Water: Flooding on the Canadian Prairies





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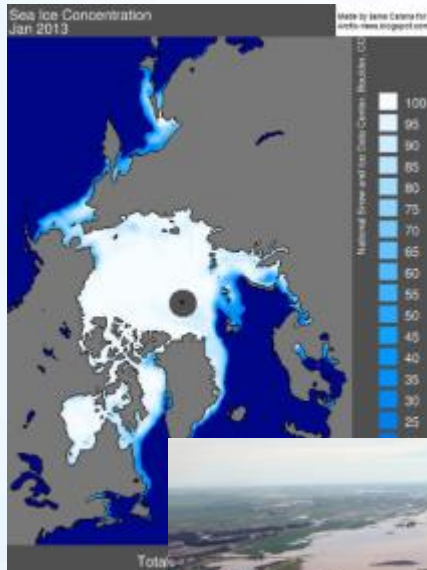
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Follow the Water: Flooding on the Central Great Plains





What we know scientifically: There are multiple linkages in the climate system



North American Drought Monitor

February 29, 2012
Released: March 13, 2012

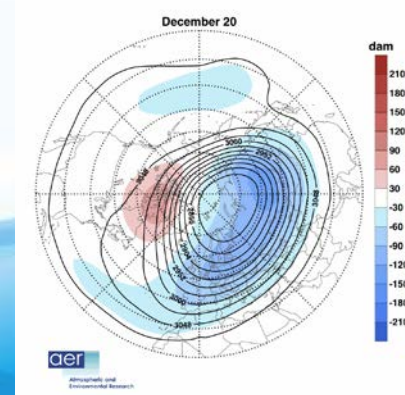
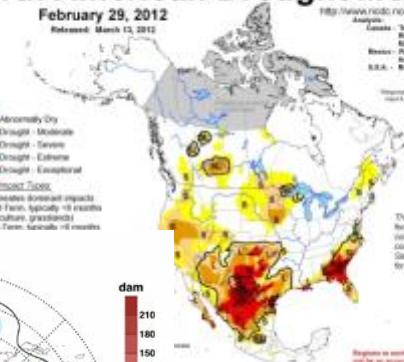
<http://www.ncep.noaa.gov/nadms/home>

Legend:

- 00 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

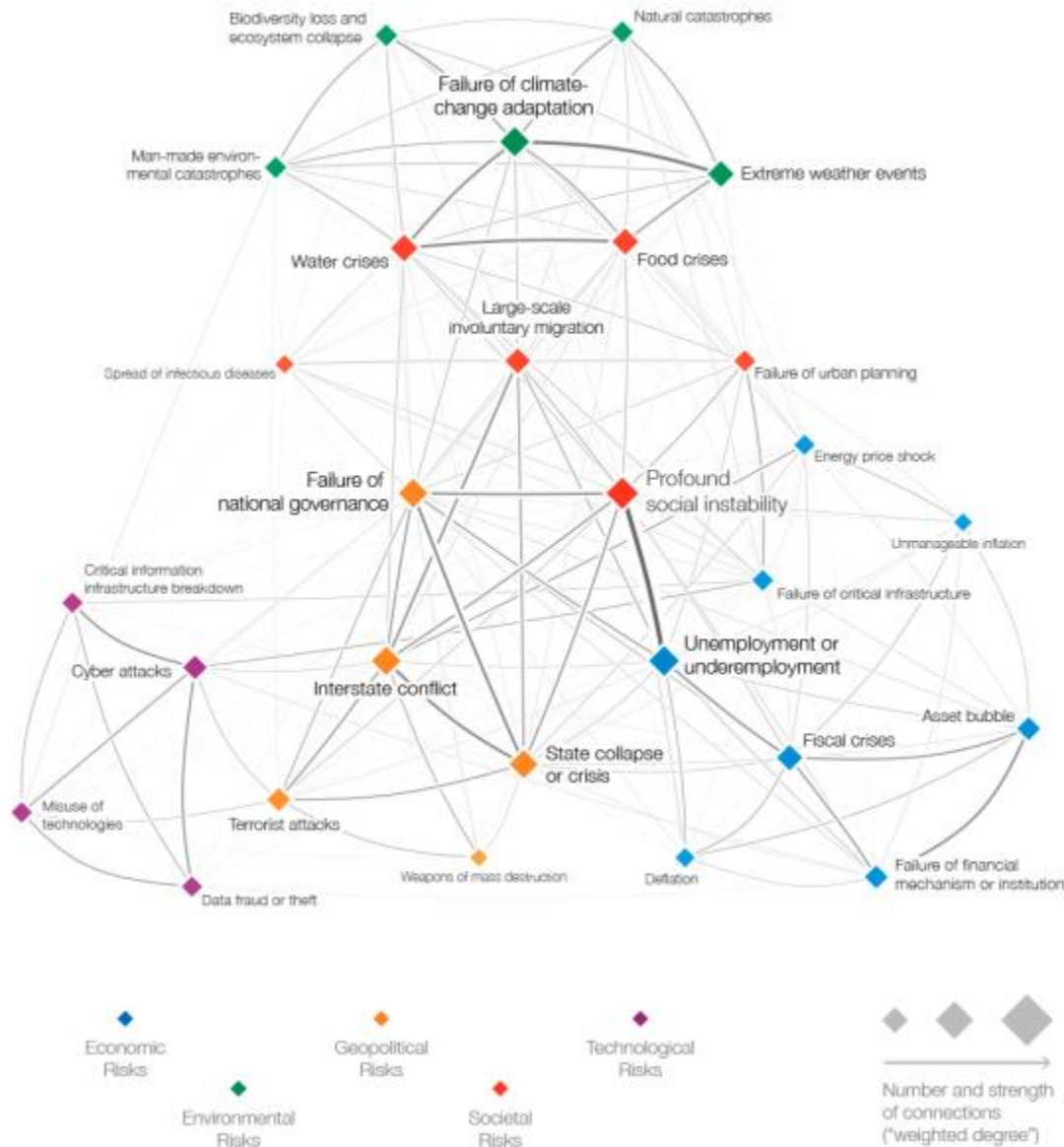
Caveats and Notes:

- 00 - Estimates current impacts
- D - Short Term, typically 10 weeks (e.g. agriculture, grasslands)
- 1 - Long Term, typically 10 months





Risk Interconnection Map





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Follow the Water: Flooding in Pakistan in 2010





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Follow the Water: Flooding on the Central Great Plains





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Follow the Water: Flooding in Southern Alberta in 2013





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Follow the Water: The prairie snowpack in Regina, Saskatchewan in late April, 2013





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Follow the Water: Then came 2014





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Follow the Water: Flooding in Kamloops, British Columbia July 24th, 2014





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Follow the Water: Flooding in Burlington, Ontario August 4th, 2014





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Follow the Water: Flooding in Steinbach, Manitoba August 28th, 2014





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Follow the Water: Flooding in Nova Scotia December, 2014



< **CBC news** Nova Scotia

CBC sports WEEKEND

Nova Scotia to be hit by federal disaster assistance cut

Province used program for 14 of last 15 years



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Follow the Water: Winter Storm Juno January, 2015



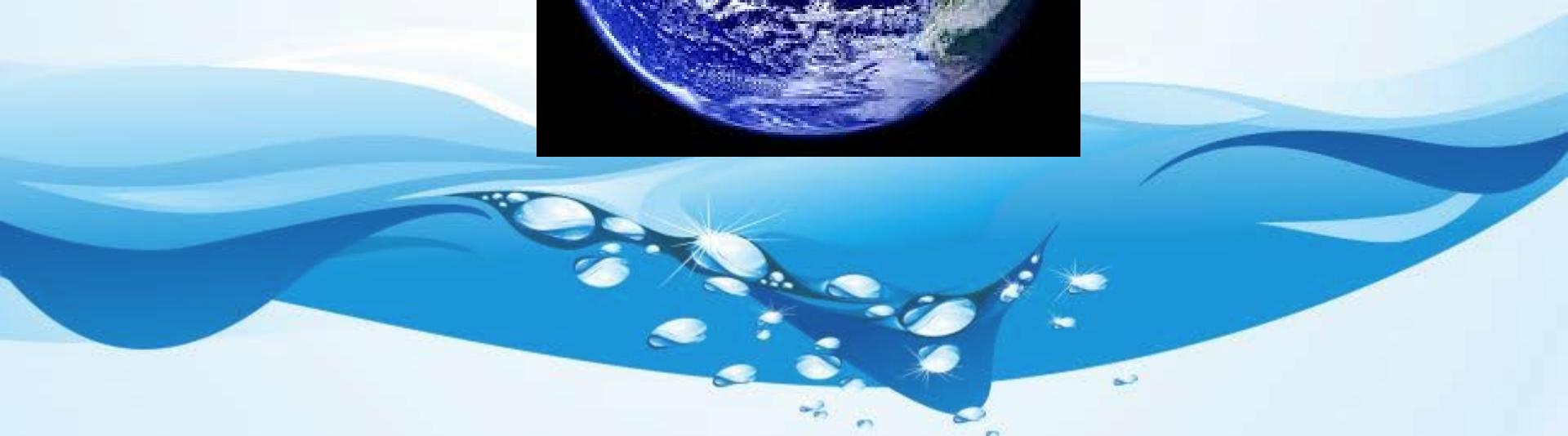


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Follow the Water: What are the larger lessons we can learn from this?





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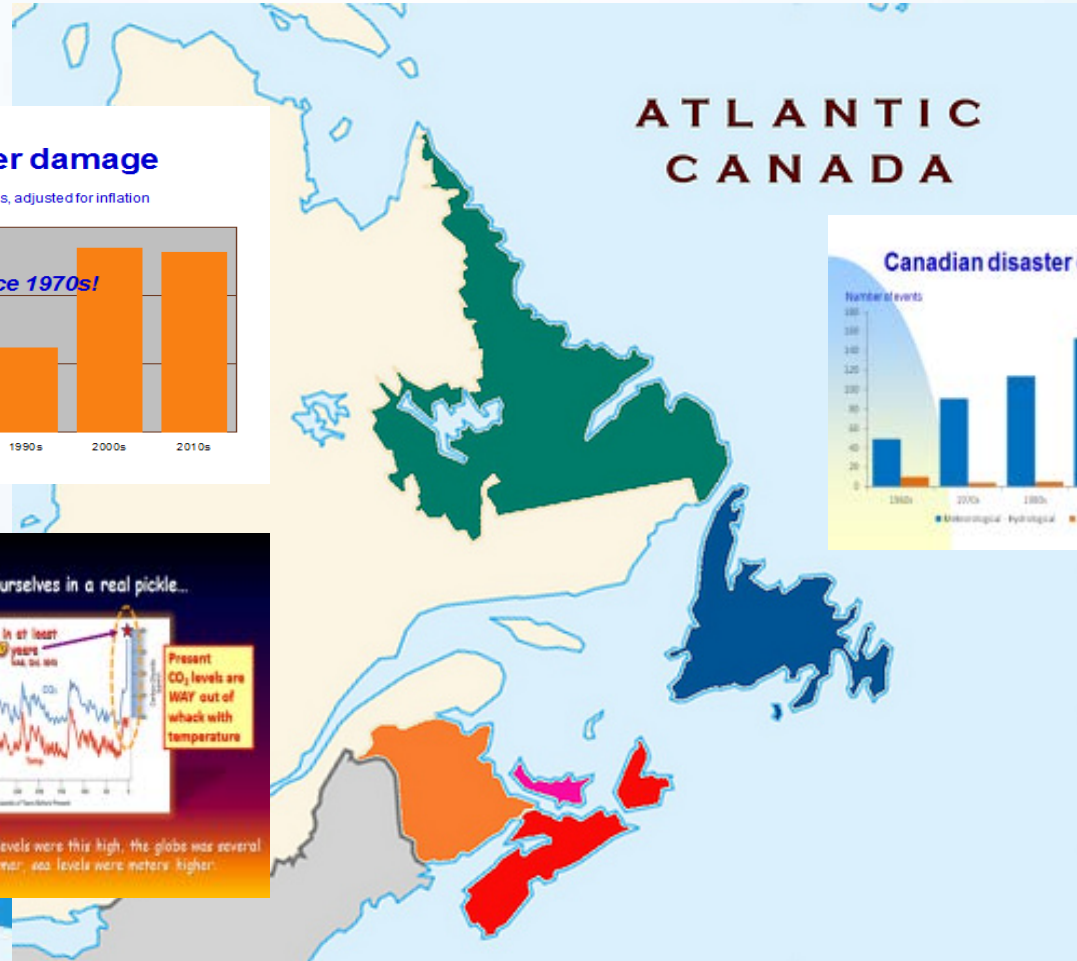
Follow the Water: A new geological era?

The 'Anthropocene' [or human-centered] geological epoch may be characterized by the collapse of natural systems' built-in resilience strategies, meaning human beings will take on even greater **responsibility** for environmental disruption and/or wellbeing...





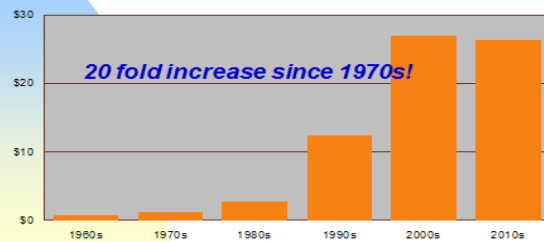
Restorative Development



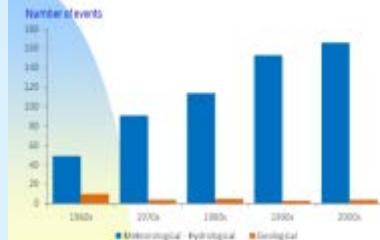
ATLANTIC CANADA

Global disaster damage

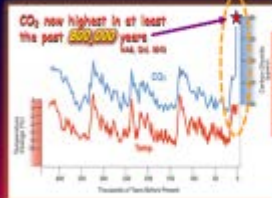
Annual insurance disaster claims, billions, adjusted for inflation



Canadian disaster damage



We've put ourselves in a real pickle...



Present
CO₂ levels are
WAY out of
whack with
temperature

The last time CO₂ levels were this high, the globe was several degrees warmer, sea levels were meters higher.



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***Our atmosphere is the suspended
residue of all physical & life
processes since the beginning of time.***



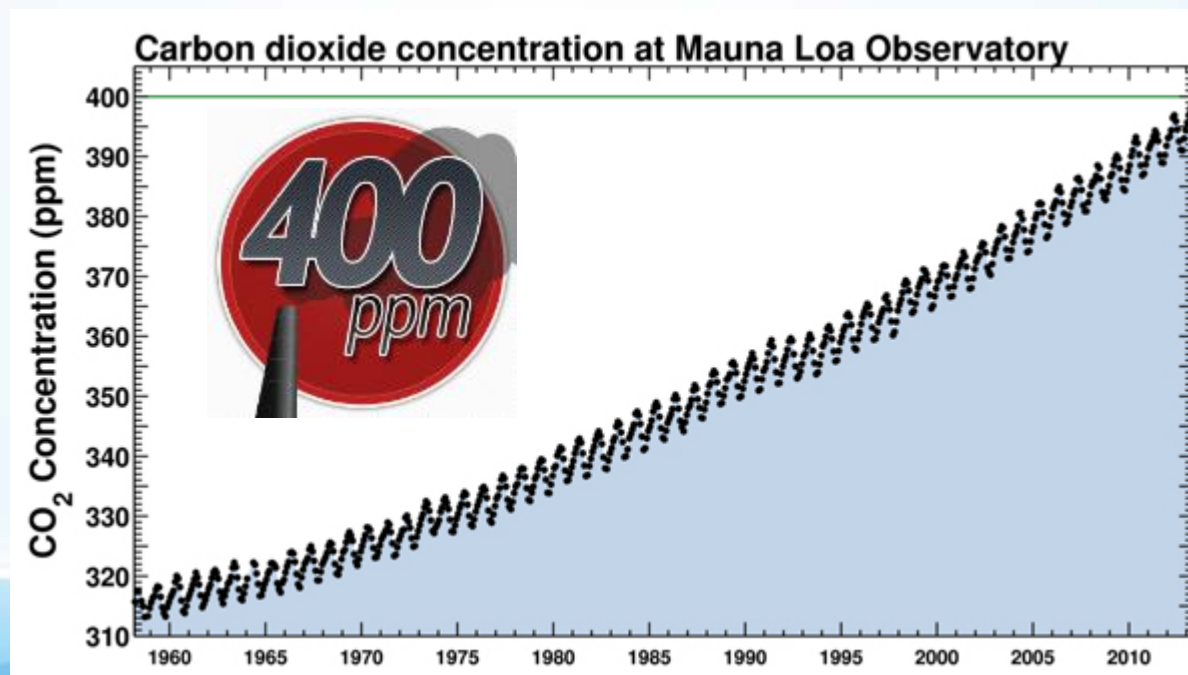



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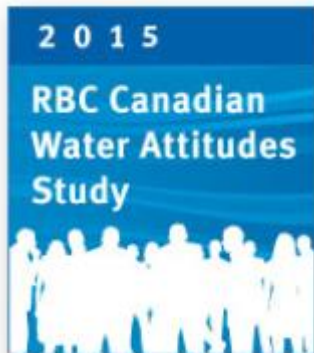
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Thinking ahead of the Keeling Curve





2015 RBC Canadian Water Attitudes Study



KEY FINDINGS MEETING
February 12, 2015

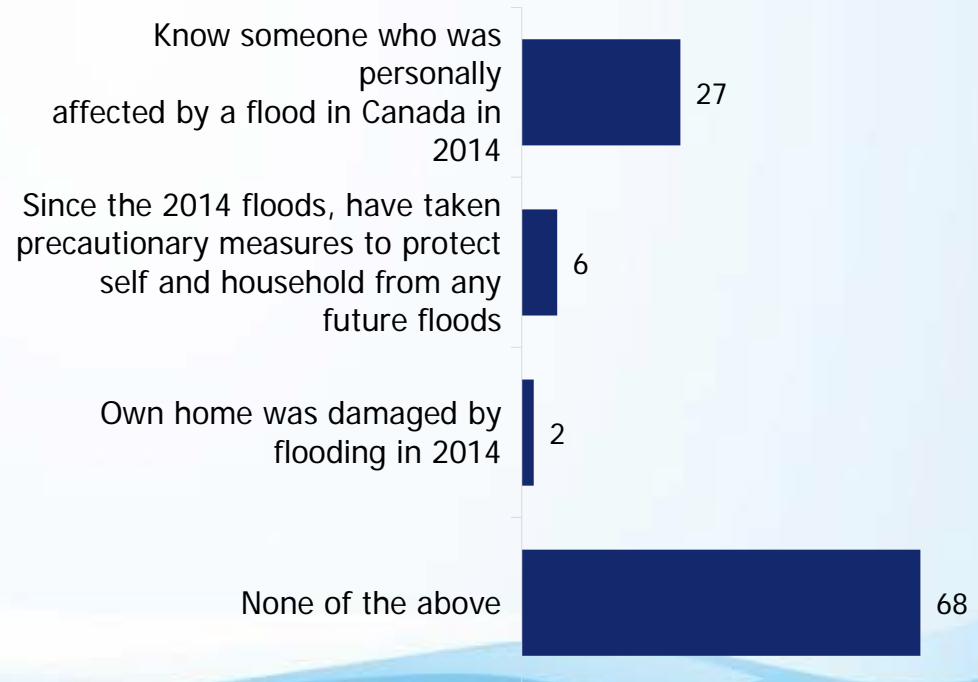
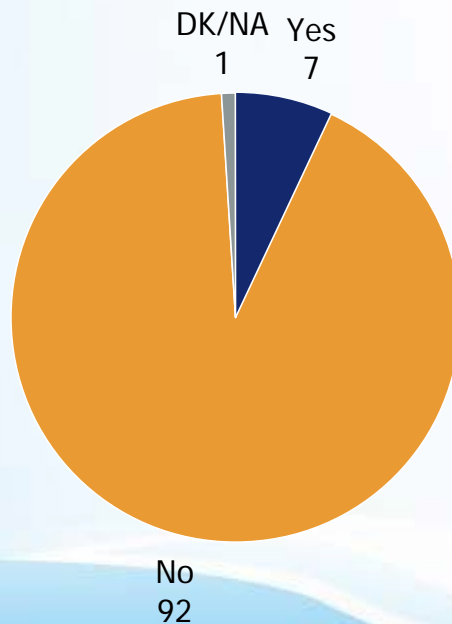


RBC
Blue Water
Project™



Personal Experience with Flooding in the last 12 months, 2015

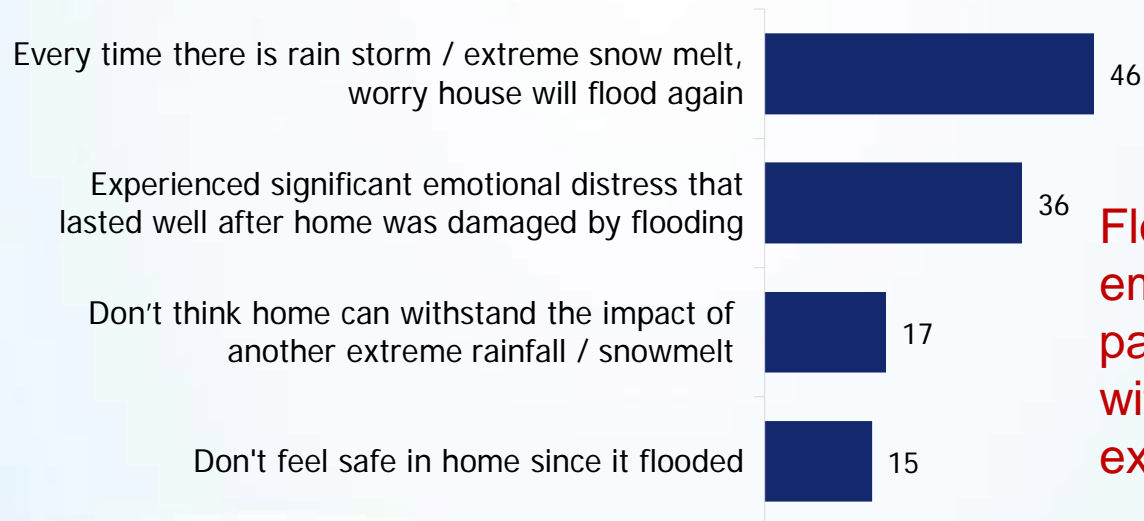
Personally affected by flooding in last 12 months?



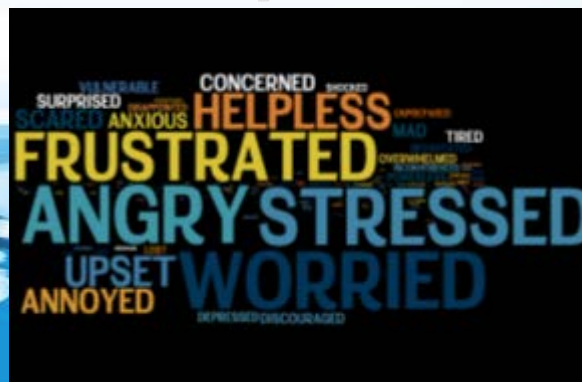
Besides the 7% of Canadians personally affected by flooding, 27% know someone affected by flooding in 2014.



Feelings After Experiencing Flooding Damage to Home



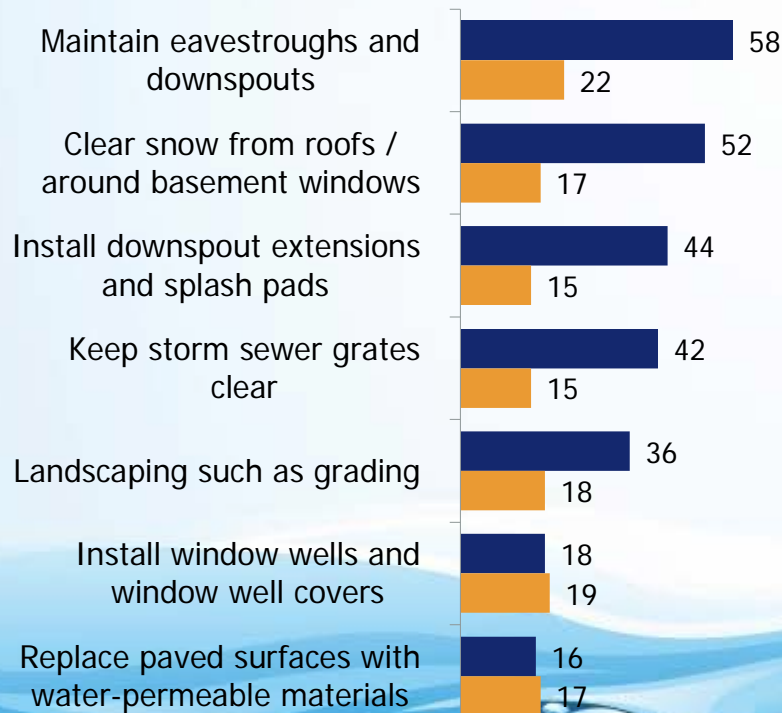
Flooding does have an emotional toll, particularly on those with flooding experience in 2014.



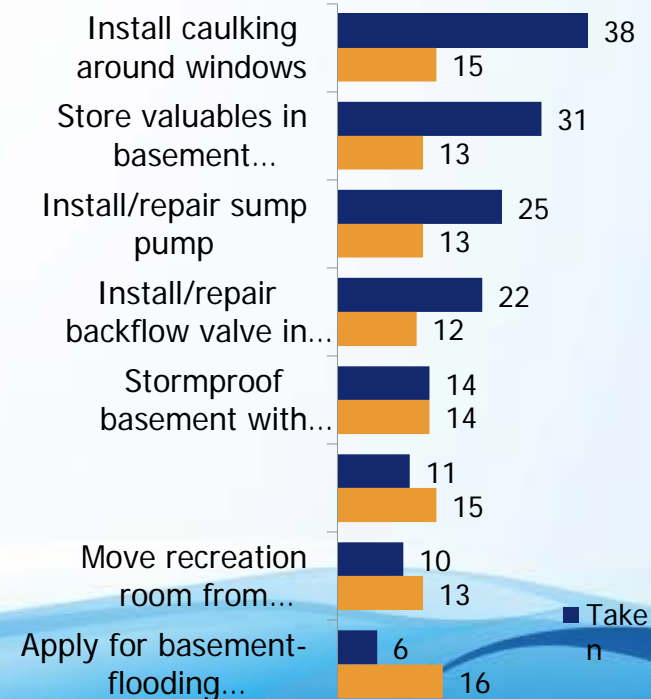


Measures Taken and Plan to Take in Coming Year to Prevent Water Damage of Home, 2015

Outside Measures



Inside Measures



■ Taken
■ Plan

The Anatomy of a Movement



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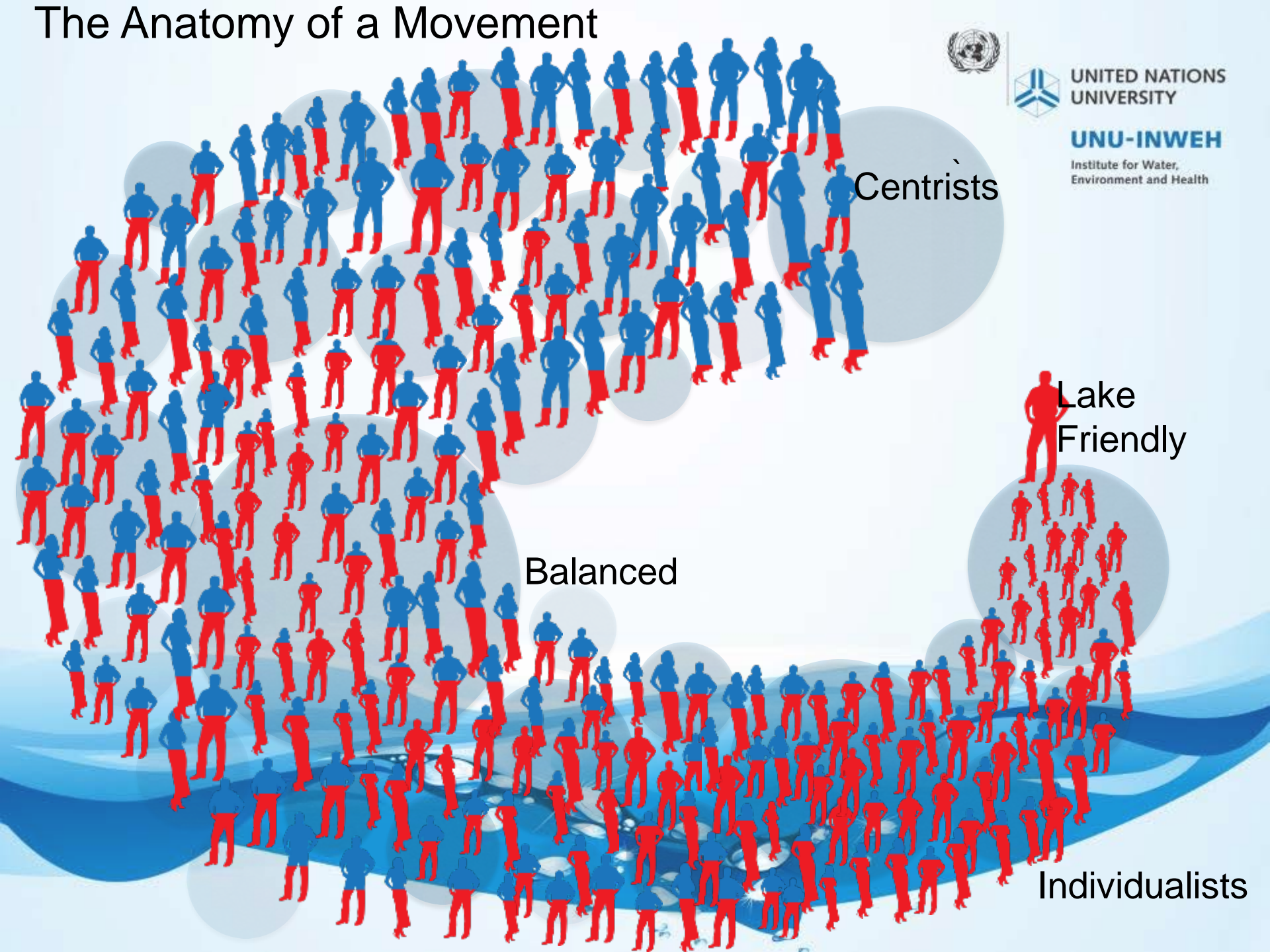
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Centrists

Lake
Friendly

Balanced

Individualists





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Leadership Must Come From All Levels.



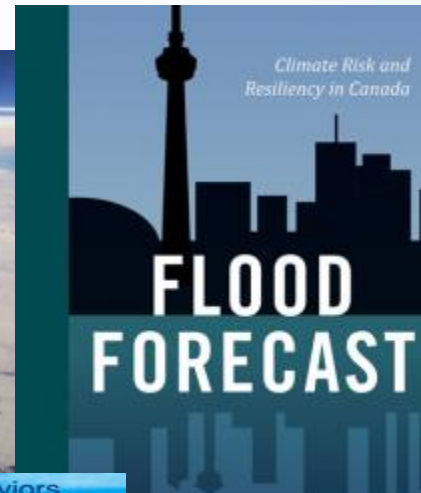


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Times Are Changing.





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Water in the World We Want: *Water & Climate Security in a Warming World*

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