

SICFM

NEVER TOO LATE - A CASE FOR RETREAT FROM FLOODPLAINS

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FACTS AND ASSUMPTIONS

NO QUESTIONS AROUND EXTREME WEATHER EVENTS BEING

- INCREASINGLY UNPREDICTABLE, INTENSIVE AND FREQUENT
- RISING GLOBAL AVERAGES IN TEMPERATURE AND SEA LEVELS
- MARGINALIZING MORE COMMUNITIES FROM ECONOMIC IMPACTS

TERMINOLOGY MATTERS

- FIGHT/WAR AGAINST CLIMATE CHANGE
- LAST CHANCE TO SAVE THE PLANET
- IRREVERSIBLE
- REBUILD TO DEFEAT THE CRISIS
 - STRIVE FOR BETTER UNDERSTANDING
 - UNDERSTAND/ACKNOWLEDGE CHANGING RISKS
 - ADJUSTMENTS SHORT-TERM/LONG-TERM
- COMPLEX DYNAMICS BETWEEN THE LAND, OCEANS, ATMOSPHERE

NEW BRUNSWICK 2019 CANADA

"....there was little chance they would be hit in back-to-back years. "We have water every 10 years," he recalls saying. "I'm not worried about it this year at all."





ROOT CAUSES??

B.C. floods among world's most devastating climate events of 2021

The full cost of flooding in B.C. is still being assessed, but according to one estimate, November flooding places B.C. as the world's fifth most expensive extreme weather event in 2021.



stefan Labbé













British Columbia

Sumas First Nation built on higher ground, unaffected by flooding in former lake bed, says chief







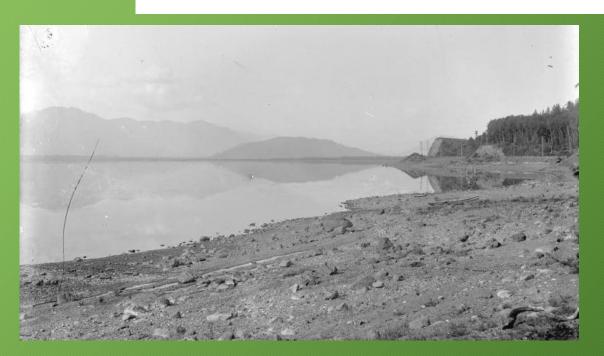




Homes on the First Nation are above Sumas Prairie which flooded this week



Michelle Gomez · CBC News · Posted: Nov 19, 2021 4:16 PM PT | Last Updated: November 20, 2021



The Storm Warnings Were Dire. Why Couldn't New York Be Protected?

New York City and state officials knew heavy rains were coming, but their preparations couldn't save the c from death and destruction.



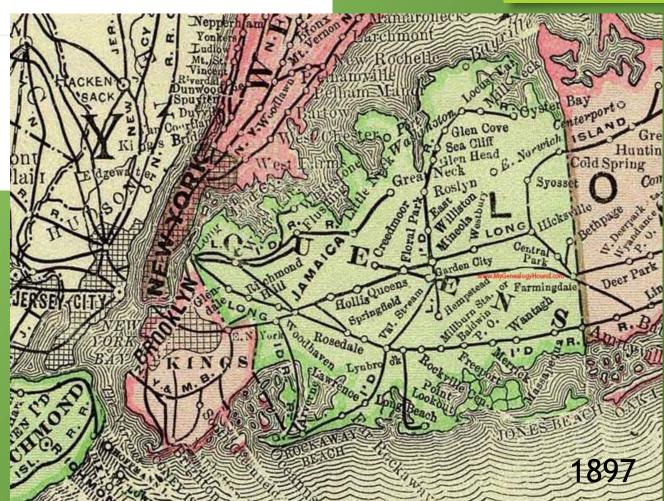




By Jesse McKinley, Dana Rubinstein and Jeffery C. Mays

Published Sept. 3, 2021 Updated Sept. 8, 2021

September 2021



GERMANY SUMMER 2021

The German Weather Service issued CODE PURPLE - its most extreme storm warning to the Eifel and Mosel regions.

JOURNAL ARTICLE

Engineering Impact on River Channels in the River Rhine Catchment (Menschliche Eingriffe in Flussläufe im Einzugsgebiet des Rheins)

Jürgen Herget, Eckhard Bremer, Thomas Coch, Andreas Dix, Georg Eggenstein and Klaus Ewald

Erdkunde

Bd. 59, H. 3/4 (Jul. -

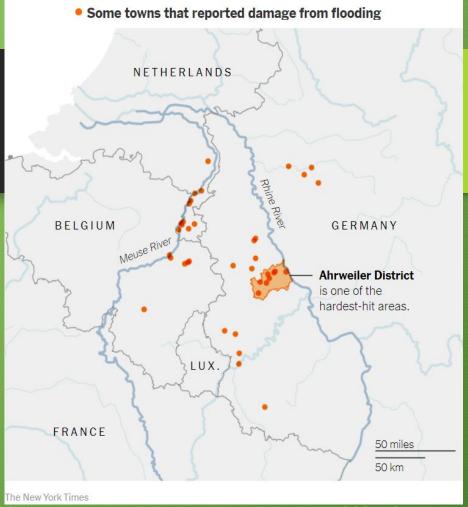
Dec., 2005), pp. 294-

319 (26 pages)

Published By:

Erdkunde





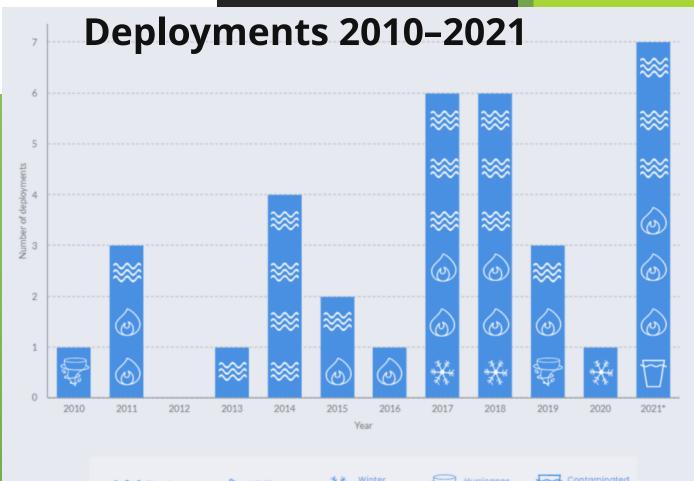
https://www.nytimes.com/interactive/2021/07/17/world/europe/europe-flood-map.html

The Canadian Armed Forces Responding to Domestic Emergencies: Some Implications

BY LOPRESPUB on DECEMBER 13, 2021

Reading Time: 5 minutes

THE DIMENSION OF CAPACITY













https://hillnotes.ca/2021/12/13/the-canadian-armed-forces-responding-todomestic-emergencies-some-implications/

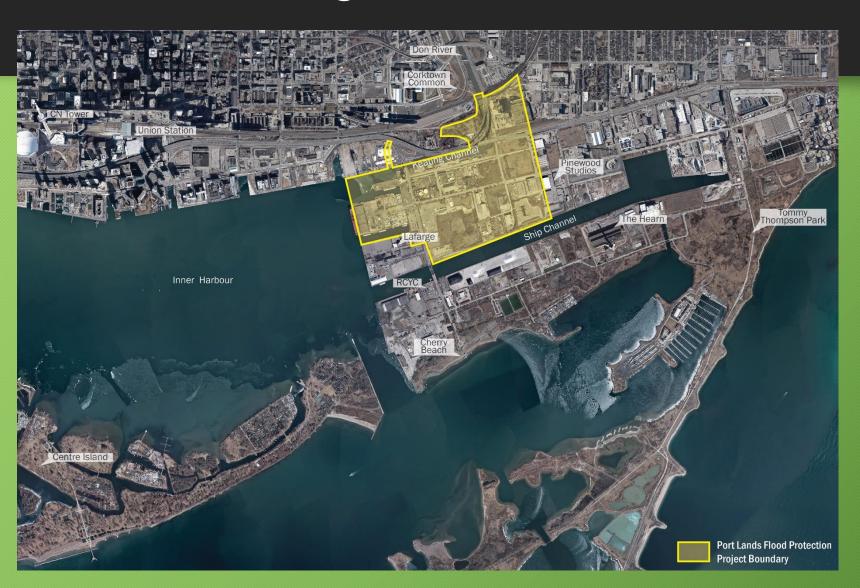
DATED MODELLING OF SIMPLISTIC VIEW

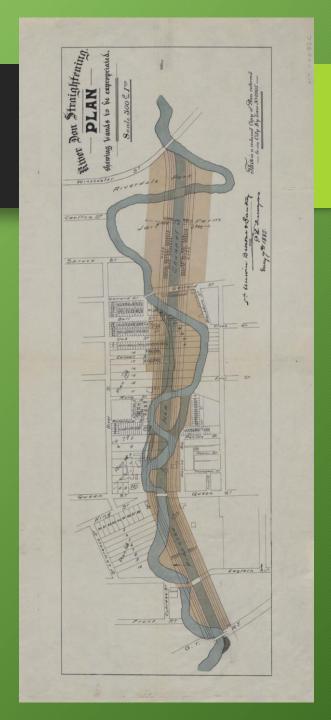
- One of the most important tools for managing water are models developed by various state and federal agencies
- These models suffer from the same simplistic view of drought and water, and they are in dire need of an update.
- Land surfaces, snow melt patterns and the climate have all changed since many of these models were developed, which means they're missing crucial pieces of today's water puzzle. What's prevented updates to the models for decades is shrinking funding for science and engineering.

By Andrew Schwartz for NYT April 4, 2022

Dr. Schwartz is the lead scientist and station manager at the University of California, Berkeley, Central Sierra Snow Lab.

Landuse management





ORE CONCEPTS

Managed retreat increasingly seen as necessary in response to climate change's fury

John Carey, Science Writer

As climate change causes seas to rise and fuels everstronger storms and droughts, humanity faces a stark choice. Communities can seek shelter from rising waters and battering storm surges by building fortifications such as the sea walls planned in Boston or Miami. Or people can figure out how to live with the Although moving a group of people is not a new concept, managed retreat presents numerous complex challenges—legal, logistical, ethical, political, financial, and architectural. Communities, and community cultures, aren't easily transported and retained. But all indications are that researchers, policymakers, and the general public will need to confront these

BRING BACK THE LOST BIO DIVERSIT PROJECT 30X30



When the Aichi Targets were <u>established in 2010</u>, roughly 13% of the world's terrestrial areas were protected while very few protections existed in the ocean.

Currently, an estimated 15% of the world's land and 7% of the ocean are protected. In order to achieve the goal of protecting at least 30% by 2030, we'll need to double the current land protections and more than quadruple current ocean protections.

Nature or hydro-meteorological risk reduction: a state-of-the-art review of...

Lack Kuangpa





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Review article | 20 Jan 2020

Nature-based solutions for hydro-meteorological risk reduction: a state-of-the-art review of the research area

Laddaporn Ruangpan [D^{1,2}, Zoran Vojinovic^{1,3}, Silvana Di Sabatino [D⁴, Laura Sandra Leo [D⁴, Vittoria Capobianco [D⁵, Amy M. P. Oen⁵, Michael E. McClain^{1,2}, and Elena Lopez-Gunn⁶

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⁶Icatalist S.L., Madrid, Spain

THE WHOLE-OF-ECOSYSTEM APPROACH

500 PEOPLE 5000 TREES



https://www.euronews.com/green/2022/02/01/take-a-look inside first-vertical-forest-home-to-500-people and 5,000-trees



BRINGING BACK THE BOGS

Around the globe, drained peatlands are emitting billions of tonnes of carbon dioxide each year. To keep climate change in check, governments and researchers are working to keep peatlands healthy. **By Virginia Gewin**

204 | Nature | Vol 578 | 13 February 2020



Tiny Forests like this one in the Netherlands, are becoming more common around the world. PHOTOGRAPH BY IVN NATUUREDUCATIE

ENVIRONMENT | PLANET POSSIBLE

Elizabeth Hewitt June 22, 2021 Why 'tiny forests' are popping up in big cities

Community forests the size of a basketball court can make an outsized difference, providing shade, attracting plants and animals, and even storing a bit of carbon.

https://www.nationalgeographic.com/environment/art -tiny-forests-are-popping-up-in-big-cities



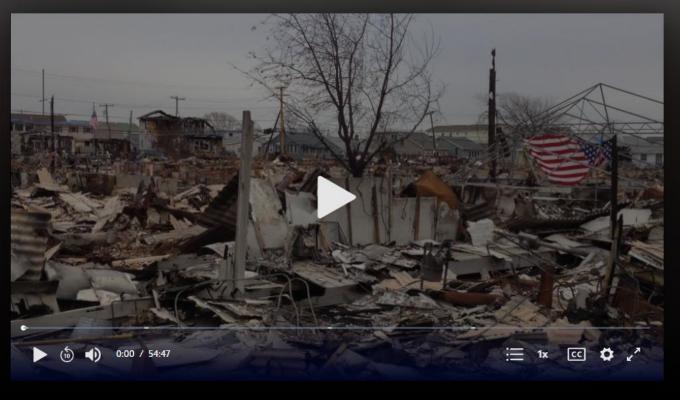


Left: This Tiny Forest was planted in Zaandam, The Netherlands, in 2015.

Right: The same Tiny Forest in 2017

PHOTOGRAPHS BY AFFORESTT

BUSINESS OF DISASTER



May 24, 2016 / 54m Season 2016: Episode 11

• WATCH THE TRAILER

PRODUCED BY: Rick Young

NEVER MISS A FRONTLINE DOCUMENTARY

GET OUR NEWSLETTER



Who profits when disaster strikes? FRONTLINE and NPR investigate.

TOPICS

Business and Economy,

Climate and Environment

Disaster Prevention and Mitigation

About Disaster Mitigation

Canada's National Disaster Mitigation Strategy

Canada's Platform for Disaster Risk Reduction

National Disaster Mitigation Program

Task Force on Flood Insurance and Relocation

Emergency Preparedness

Emergency Management Planning

Emergency Management Training

Emergency Management Exercises

Capability Improvement Process

All-Hazards Risk

Task Force on Flood Insurance and Relocation

Background

Natural disasters are increasing in frequency and severity. In light of the growing threat to the safety of Canadians due to climate change and continued urbanization in high-risk flood areas, the Government of Canada is moving forward with a number of measures to help Canadians reduce their financial and physical vulnerability to flooding.

Among these measures, the Prime Minister instructed the Minister of Public Safety and Emergency Preparedness and the Minister of Families, Children and Social Development to create a new, low-cost national flood insurance program to protect homeowners at high risk of flooding and without adequate insurance protection. As well, the Prime Minister asked that they develop a national action plan to assist homeowners with potential relocation for those at the highest risk of repeat flooding.

These undertakings are complex, and require a collaborative, multi-disciplinary approach involving federal, provincial and territorial government officials, the insurance industry and stakeholders and partners impacted or concerned by Canada's growing vulnerability to flooding.

Mandate of the Task Force on Flood Insurance and Relocation

The Task Force will examine options for low-cost residential flood insurance to residents of high risk areas. It will also consider options for potential relocation for residents of areas at the highest risk of recurrent flooding.

At the same time, Indigenous Services Canada will work with First Nations partners on a dedicated Steeri Committee on First Nations Home Flood Insurance Needs to examine the unique context on reserves. Th Government of Canada is also committed to ensuring that broad Indigenous perspectives are included in management in Canada. The Task Force and Steering Committee will share information with one another closely together to engage with various partners, including with First Nations off-reserve, Inuit, and Métis communities and organizations.

The results of the work of the Task Force will be presented in a public-facing, statement-of-fact report to b to the Deputy Minister of Public Safety and President of the Canada Mortgage and Housing Corporation.

BUILDING A SAFE AND RESILIENT CANADA



Disaster Resilience and Security Advisory Table Meeting

February 24, 2022 RDIMS # 4220936

By Co-Chairs:

Stéphanie Durand, Director General, Policy and Outreach Directorate, Public Safety Canada Craig Stewart, Vice President, Insurance Bureau of Canada



THRIVING NATURAL ENVIRONMENT

By 2050, all of us in Canada have strengthened our understanding of natural systems and transformed our relationships and behaviour within them. We have learned from and acted upon diverse ways of knowing to ensure ecosystems and communities can collectively evolve, adapt and thrive in a changing climate. In achieving a full recovery of nature and sustaining a thriving and resilient natural environment, we have halted and reversed biodiversity loss; recognized Indigenous laws, rights, and title; and, embraced the values of social, environmental, and intergenerational justice.

RESILIENT INFRASTRUCTURE



By 2050, infrastructure systems in Canada are climate resilient and continue to intentionally be adapted to a changing climate to deliver reliable, equitable, and sustainable services to all of society, including First Nations, Métis Nation, Inuit, and urban and off-reserve Indigenous peoples.

HEALTH AND WELLBEING

By 2050, all people living in Canada, their communities, and health, social, environmental and economic systems across governments that support them and that are critical for he wellbeing, are resilient and thriving in a changing climate. I includes a transformational change to Canada's health sect one that is just, equitable, decarbonized, innovative, and according to the communities of the communities are critical for health sections.

DISASTER RESILIENCE AND SECURITY

By 2040-50, Canada has taken concrete action to adapt to climate impa that maximizes overall disaster resilience, wellbeing and personal livelihe including taking measures that sustainably address social, physical, and vulnerabilities.

 Potential risks have been reduced as Canadians and communities have enabled by inclusive and accountable governance, information, tools capabilities required to best prepare for, mitigate, respond, recover fr ranging hazards, risks and consequences from disasters linked to the

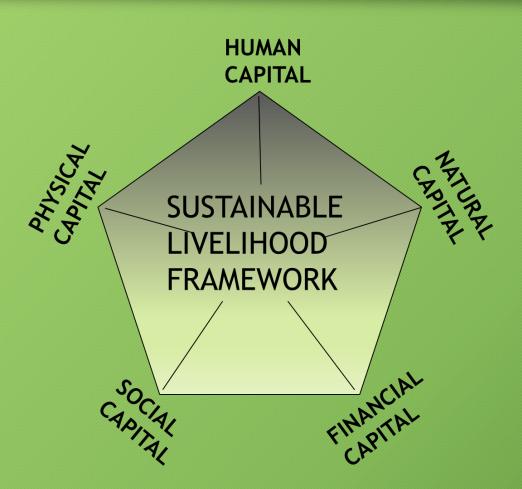
STRONG AND RESILIENT ECONOMY

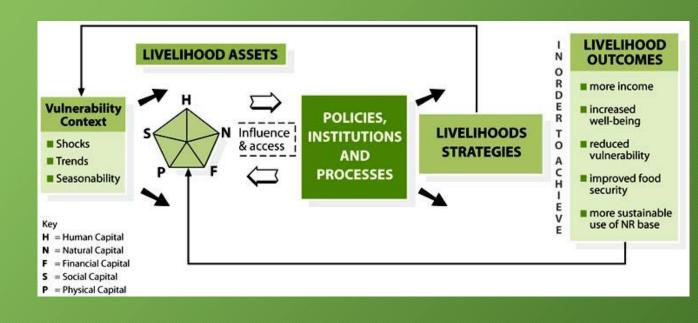


Through leadership, collaboration, and responsible (adaptive) decision-making, Canadians create an economy that:

- anticipates, manages, and responds to climate change impacts;
- reflects the true value of nature (natural assets) and accurately prices climate change risks and costs;
- incentivizes investment in climate change adaptation (and mitigation);
- captures the social and economic opportunities of a changing environment, domestically and internationally; and
- is just, equitable, and empowering for communities, Indigenous people, and vulnerable sectors.

BASICS OF SUSTAINABLE LIVELIHOODS





The University of Chicago

HUMAN ADJUSTMENT TO FLOODS

A GEOGRAPHICAL APPROACH TO THE FLOOD PROBLEM IN THE UNITED STATES

A DISSERTATION SUBMITTED TO THE FACULTY OF THE DIVISION OF THE PHYSICAL SCIENCES IN CANDIDACY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF GEOGRAPHY
JUNE, 1942

Research Paper No. 29

By GILBERT FOWLER WHITE

The New York Times

NEWSLETTER

Climate Forward

A growing force in the climate movement: Moms

Activists are deploying the moral authority of

Facing Disastrous Floods, They Turned to Mangrove Trees for Protection In the Sundarbans, an ecological treasure straddling India and Bangladesh that is now on the front lines of climate change, local women are leading an effort to mitigate the dangers of rising waters.

By Suhasini RajPhotographs and Video by Saumya Khandelwal, for New York Times, April 10, 2022



Article

Risk and Resilience: A Case of Perception versus Reality in Flood Management

Nirupama Agrawal 1,*, Mark Elliott 2 and Slobodan P Simonovic 3

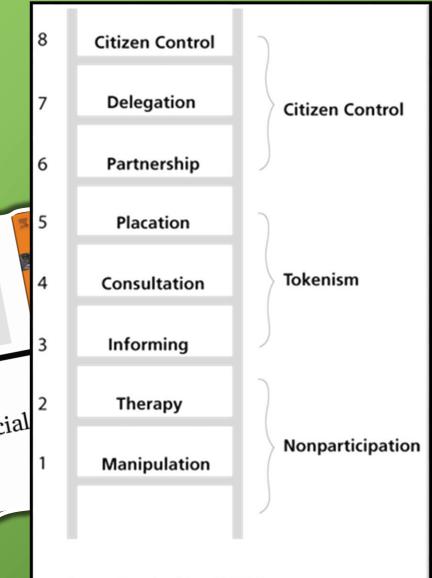
1 Disaster & Emergency Management Program, York University, Toronto

Contents lists available at ScienceDirect

MDPI

International Journal of Disaster Risk Reduction journal homepage: www.elsevier.com/locate/ijdrr

Flooding in The Netherlands: How people's interpretation of personal, social and institutional resources influence flooding preparedness José Kerstholt^{a,b,*}, Hanneke Duijnhoven^a, Douglas Paton^c



Arnstein's Ladder (1969)

Degrees of Citizen Participation

Study finds majority of Canadians who live in high-risk flood zones don't know it

University of Waterloo researchers want to see Canada develop a national flood risk strategy







Flooding has surpassed forest fires as the top cause of property damage in Canada in the past several years, costing property owners more than \$1 billion in losses each year, according to government figures.

Despite the threat, a recent study has revealed that an overwhelming majority of Canadians living in high-risk regions are not only unprepared to deal with the impact of floods, but they are also unaware of the potential danger.

A 2020 survey conducted by Partners for Action, a climate resiliency network based at the University of Waterloo, and insurance firm The Co-operators, found that out of the 2,500 respondents living in designated flood-prone areas, 94% did not know they were living in such an area and more than half, or 57%, did not have flood insurance. For the remaining 6% who were aware of the flood-risk in their communities, only about 30% had taken action to protect their homes.

The researchers did the same study in 2016 and they were concerned that even after four years had passed, the

THANK YOU

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