

Future flows: climate resilience, environmental flows & Alberta's water law

Jason Unger

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Environmental
Law Centre

About the ELC

- Our vision is a society where laws secure an environment that sustains current and future generations.
- Mission: to educate and champion for strong environmental laws so that all Albertans can enjoy clean water, clean air and a healthy environment.

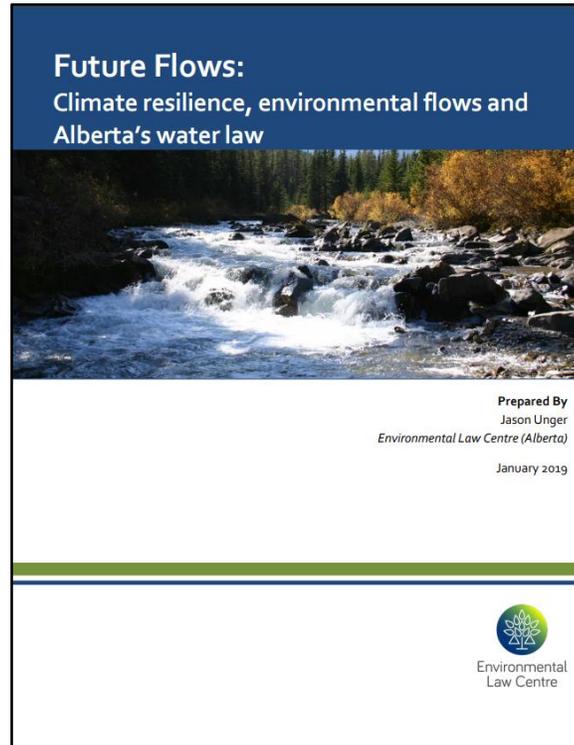


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Outline

- Uncertainty, science and water regulation
- The Water Act: is it up to the task?
- Common pool resource management and adaptive governance
- Recommendations



Additional resources:

Arlene Kwasniak "Climate Change and Water: Law and Policy Options for Alberta" *Canadian Institute of Resources Law Occasional Paper #57*, March 2017. Online: https://cirf.ca/files/cirf/water-and-climate-change_kwasniak.pdf.

David Percy "Climate Change and Water Allocation in Alberta" in *Resilient Systems, Resilient Communities* (Edmonton: University of Alberta and the Kule Institute for Advanced Study, 2018). Online: <https://era.library.ualberta.ca/items/489c0395-45a1-4290-a1ad-210a543d6d25>.

Water and law



Planet Earth II, BBC:

<https://www.bbc.co.uk/programmes/p04dg3yw>

+ Science

“In this study, we have used a BSTQR model, which applies the spatiotemporal quantile regression in a flexible and unified framework, to model precipitation changes at different quantile levels and their teleconnections to large-scale climate variabilities”

X. Tan, TY Gan, S. Chen, B. Liu, Modeling distributional changes in winter precipitation of Canada using Bayesian spatiotemporal quantile regression subjected to different teleconnections (2018) *Climate Dynamics* 2018, online
<https://link.springer.com/article/10.1007/s00382-018-4241-0>

Framing of the discussion- water quantity and IFN

ELC's objective for regulatory system

- Alberta's water resources are managed or restored to levels where resource use is sustainable, where aquatic species diversity and abundance is maintained, and aquatic ecosystems are resilient to climate variability.

Water Act approach

- Water conservation objective
- Strategy for the protection of the aquatic environment
- Discretion in licencing (w/ terms and conditions) and renewals for diverting water

Policy approach

- *The Alberta desktop method for determining environmental flows (instream flow needs)*
- *Draft Surface Water Allocation Directive*
- *Others (e.g. enhanced oil recovery)*

Water world: complexity and uncertainty - current and future

- Groundwater-surface water interactions
- Land –water interactions
- Eco-hydrology
- Snowpack
- Glaciers
- Temperature
- Precipitation patterns



A nexus between science and decisions?

Faramarzi, M., Abbaspour, K., Adamowicz, W.L., Lu, W., Fennell, J., Zehnder, A.J.B, Goss, G., 2016. Uncertainty based assessment of dynamic freshwater scarcity in semi-arid watersheds of Alberta, Canada, *Journal of Hydrology: regional Studies* 9: 48–68

See the Watershed Science and Modelling Laboratory

<https://cms.eas.ualberta.ca/faramarzilab/lab-members/monireh-faramarzi/>

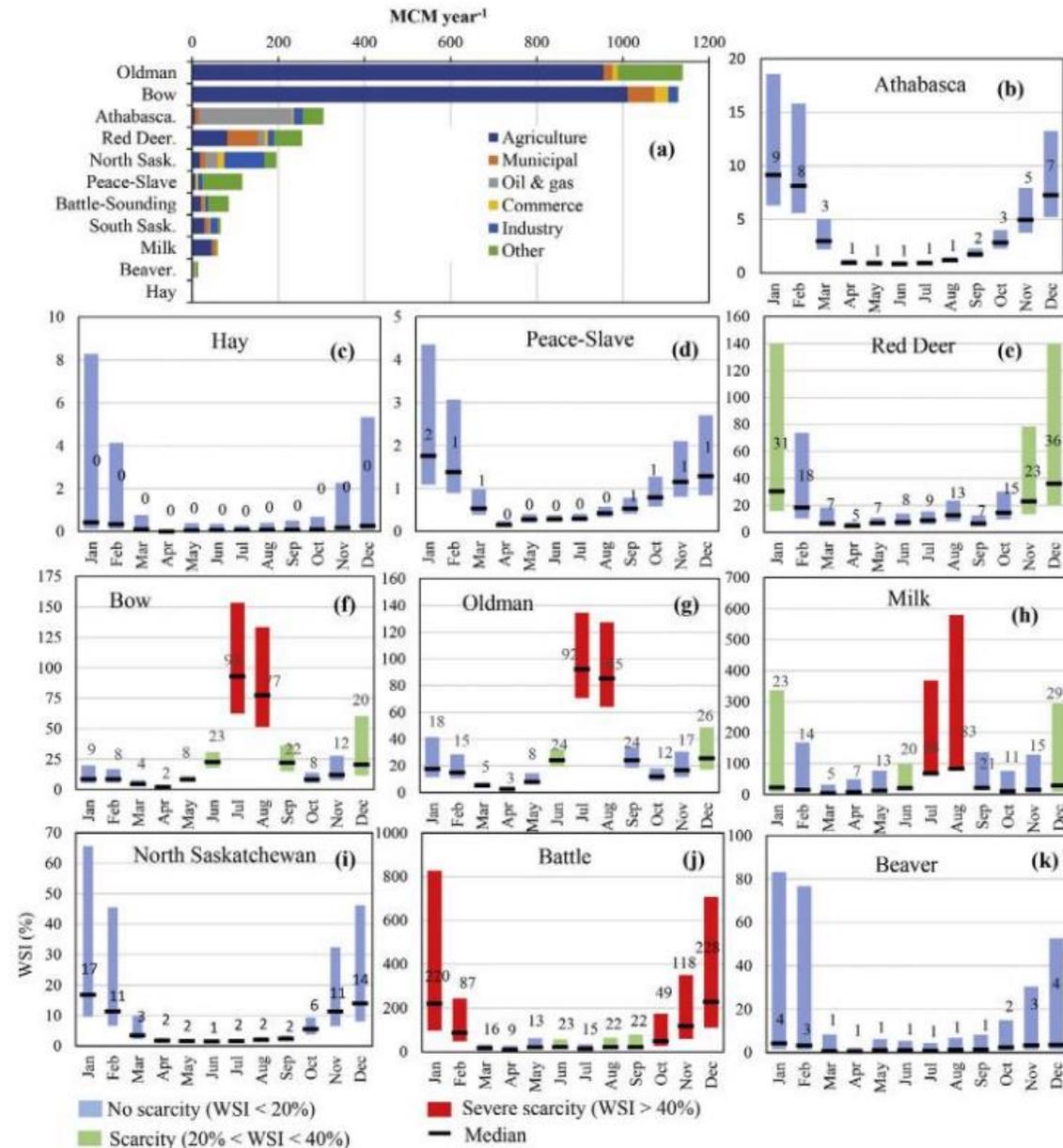


Fig. 9. Estimated water use of different sectors (a), and computed monthly water scarcity indicators (b–k) for different river basins. The WSI calculated as the ratio of water consumption to simulated renewable blue water resources (RBWR). The range is related to the use of L95PPU-RBWR and U95PPU-RBWR in the ratio. The colors, depicting severity of the scarcity, are specified based on the median of simulated RBWR.

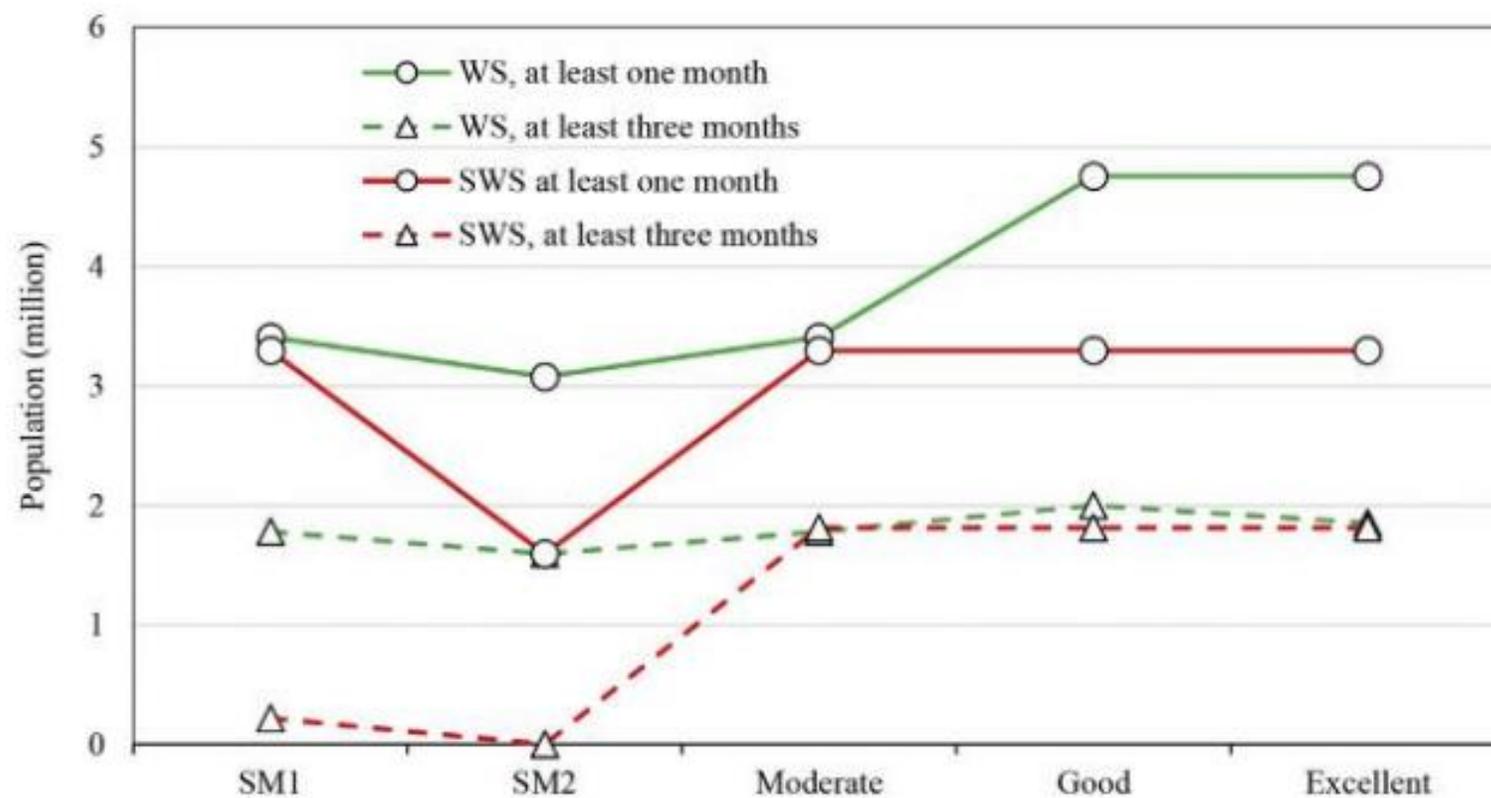
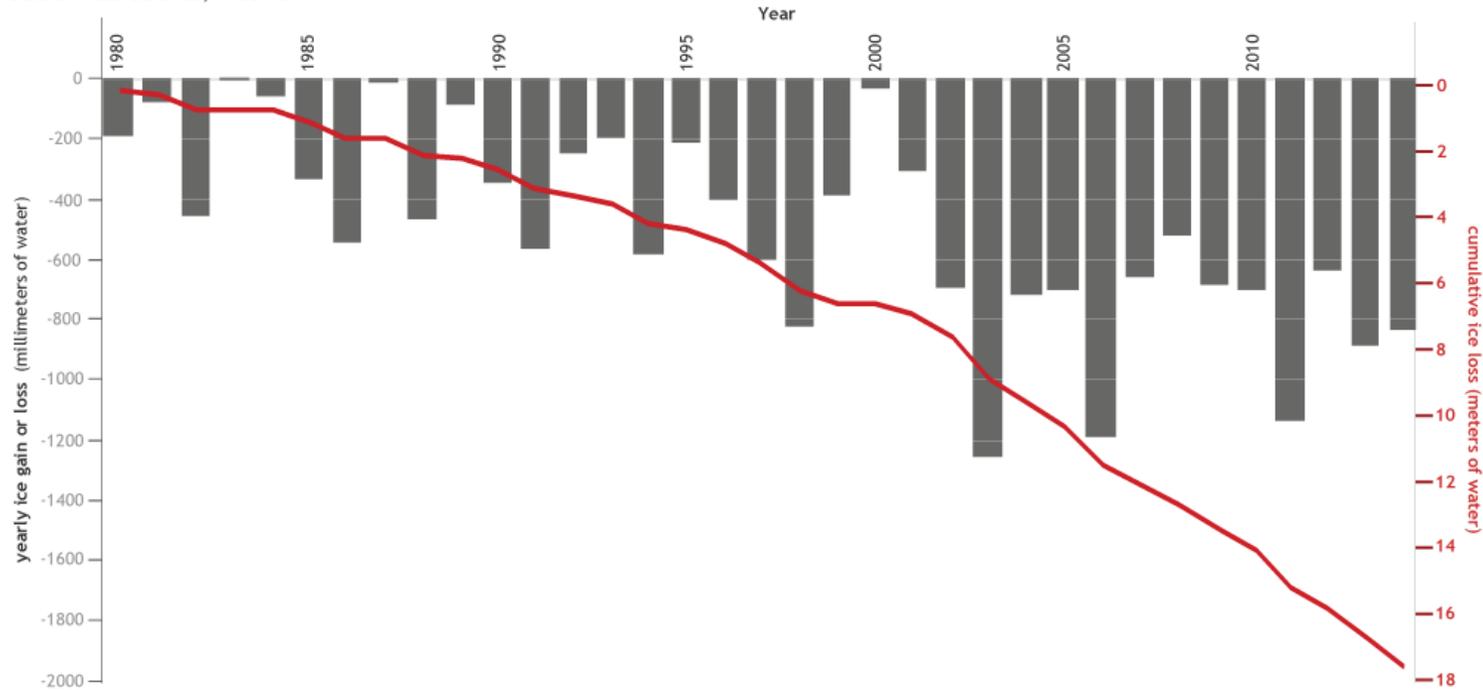


Fig. 11. Comparison of the estimated population size exposed to different levels of water scarcity under various scenario models. WS: Water Scarcity; SWS: Severe Water Scarcity.

- Contributions from glaciers will diminish

- Annual gain or loss in mass for 37 reference glaciers (gray bars) from 1980-2014* and the long-term accumulated loss (red line). Mass is estimated as the depth of water that would result if the melted ice and snow were to spread out across the surface of the glacier. *Data from 2014 are preliminary. NOAA Climate.gov graph adapted from Figure 2.10 in the BAMS State of the Climate in 2014 report.

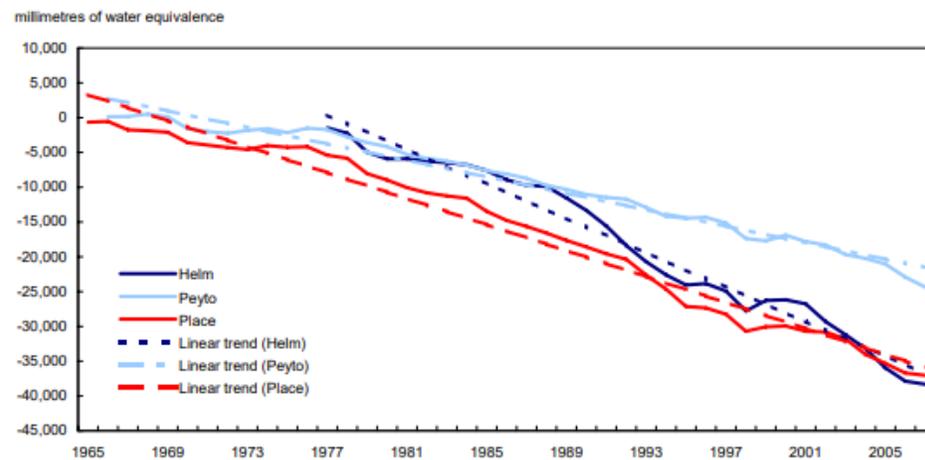
Glacier mass balance, 1980-2014



StatsCan, Trends in glacier mass balance for six Canadian glaciers

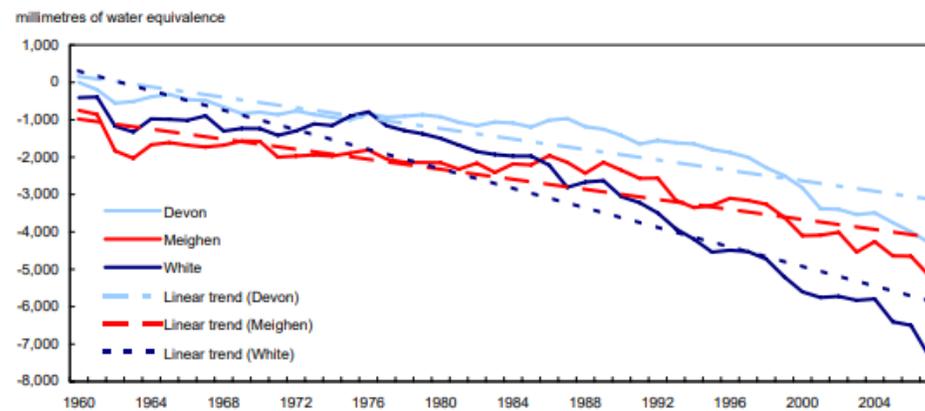
<https://www150.statcan.gc.ca/n1/en/pub/16-002-x/16-002-x2010003-eng.pdf?st=gzkDursg>

Chart 1
Cumulative net mass balance, Western Cordillera glaciers

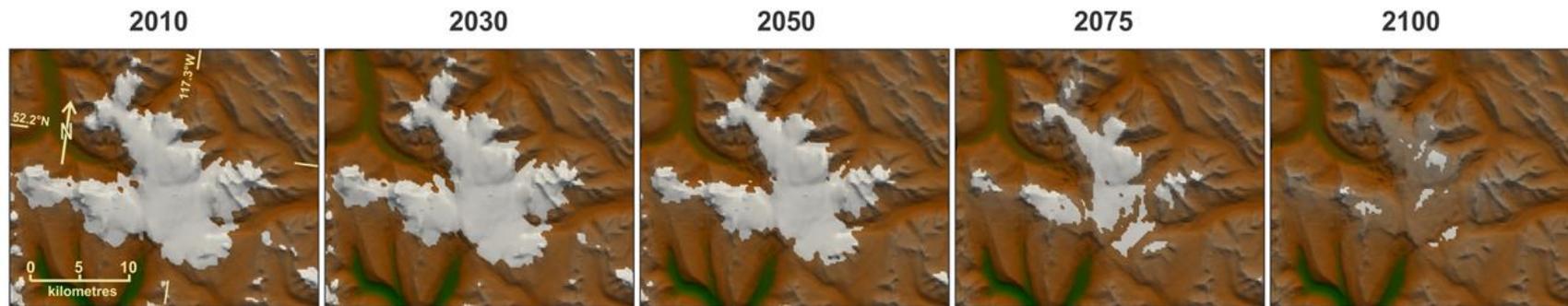


Note(s): Chart 1 and Chart 2 use different scales for the y-axis.
Source(s): Natural Resources Canada, Glaciology Section - State and Evolution of Canada's Glaciers Initiative.

Chart 2
Cumulative net mass balance, High Arctic glaciers



Note(s): Chart 1 and Chart 2 use different scales for the y-axis.
Source(s): Natural Resources Canada, Glaciology Section - State and Evolution of Canada's Glaciers Initiative.

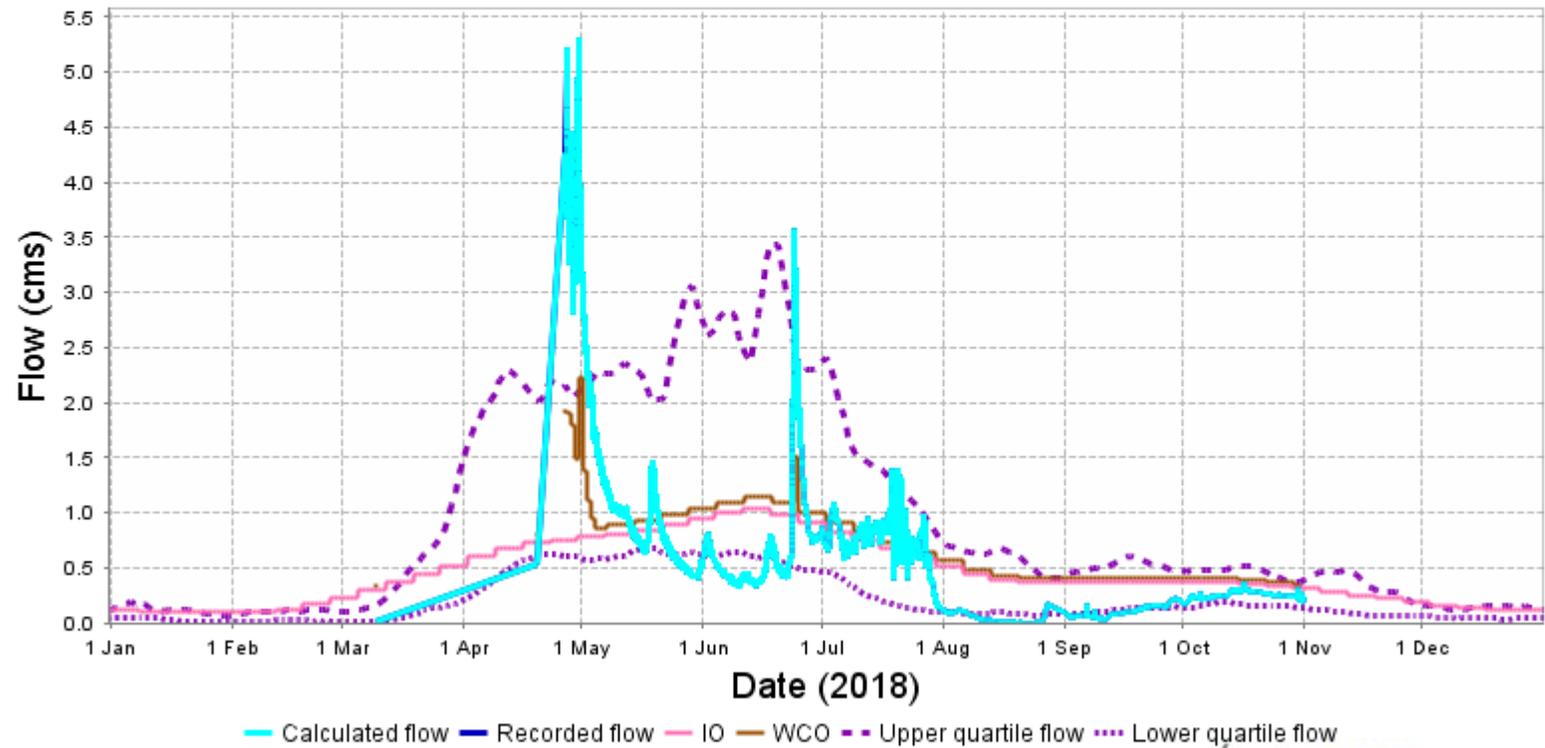


Under a less optimistic scenario in which carbon dioxide levels in the atmosphere hit 1,370 ppm, the Columbia Icefield will have nearly disappeared by 2100. (Garry Clarke/University of British Columbia)
Nature GeoScience
volume8, pages372–377 (2015)

Current
reality
SSRB

Recorded flow (blue), calculated flow (turquoise),
natural flow (red), IFN (green), IO (pink), WCO (brown),
and normal recorded flow range (purple) for 05BK001

Fish Creek near Priddis



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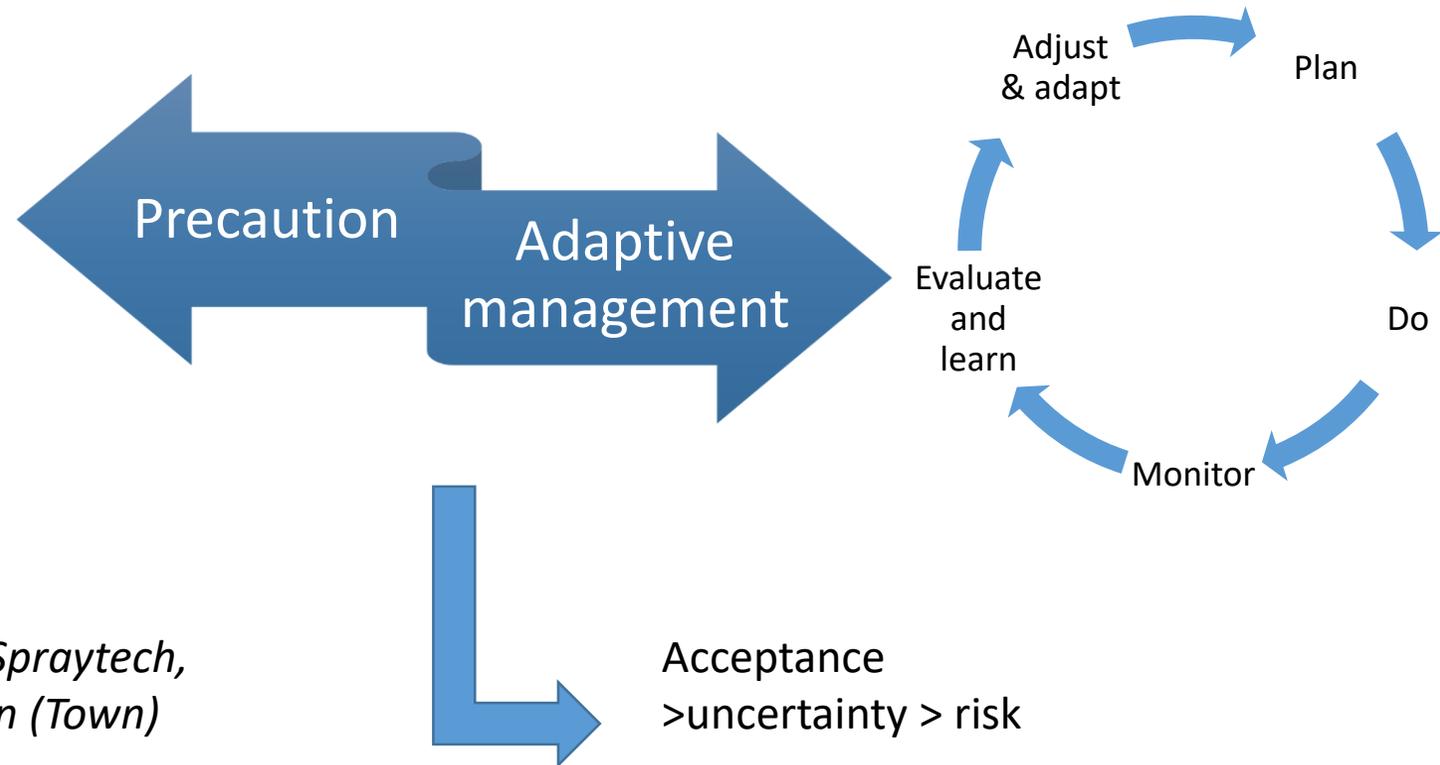
How do we deal with current and future risks to instream flows?

How do we deal with current and future uncertainty about supply and demand?

Embracing uncertainty – regulatory and governance responses

Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

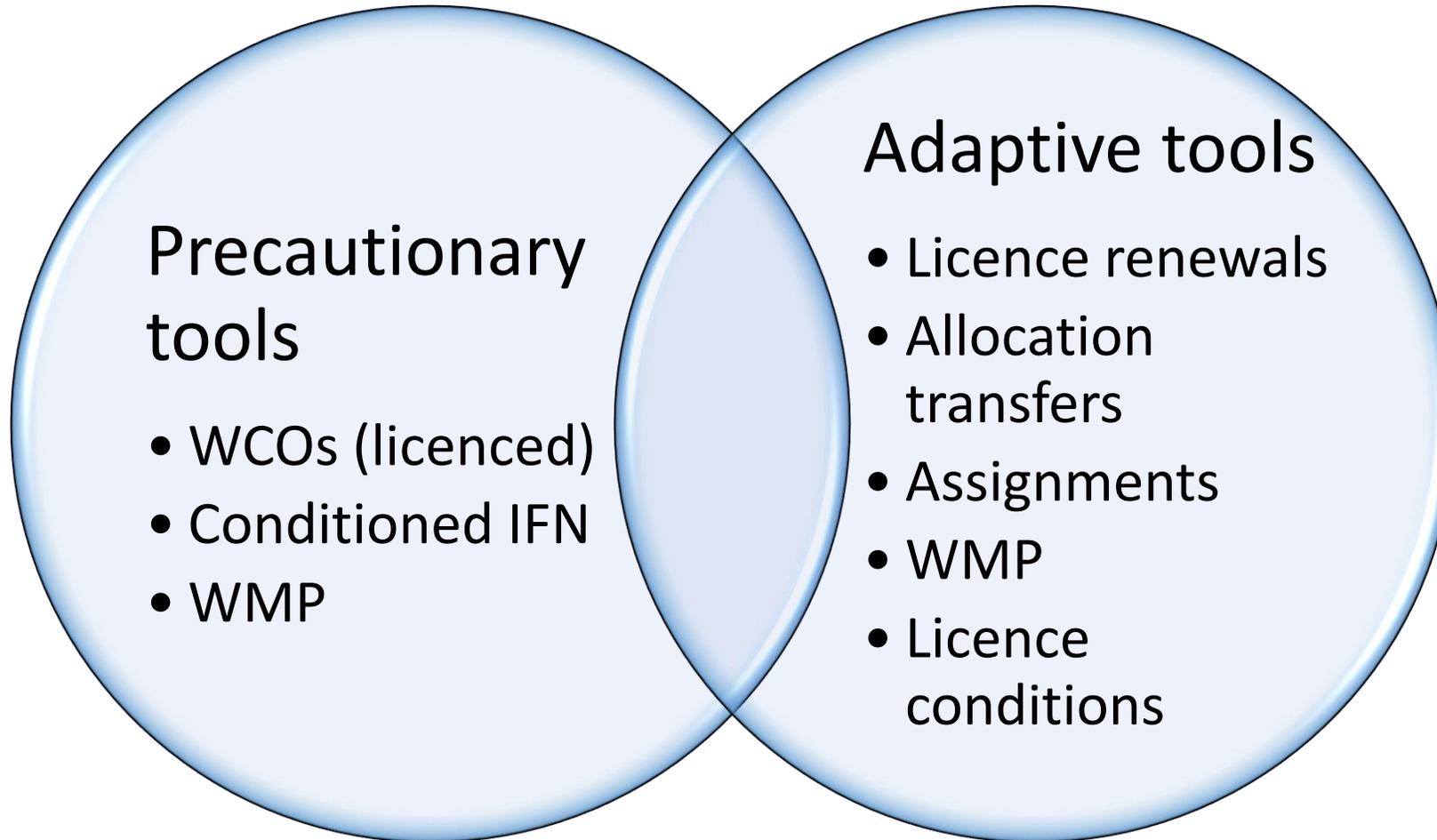
SCC 114957 Canada Ltée (Spraytech, Société d'arrosage) v. Hudson (Town)



Is the Water Act precautionary and adaptive as written?

If there are tools for exercising precaution and adaptation are they used proactively?

If not why not?



Precautionary tools

- WCOs (licenced)
- Conditioned IFN
- WMP

Adaptive tools

- Licence renewals
- Allocation transfers
- Assignments
- WMP
- Licence conditions

Has the *Water Act* been applied with precaution?

- Government is slow to identify and licence WCOs (except SSRB) – Act provided WCO specific priority within 5 years of passing
- WCO in South Saskatchewan is likely insufficient to protect ecological systems
 - Water licence transfers and holdbacks are primary tool but are insufficient
- Water management plans (2) – Director’s decisions still largely open ended and discretionary
 - “significant adverse effect” approach to decisions is not precautionary
 - Matters and factors for consideration could be far more proactive
- Temporary diversion licences – typically suspended or stopped
- Licences- even where relevant conditions are in place –voluntary reductions in volumes diverted.
 - Licences may require automatic curtailment at certain instream flows but other licences have notification requirements (e.g. 12 months) – deemed licences have fewer options

Future precautions?

Federal Bill C-68 – Fisheries Act (HADD +)

35 (1) No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat

- **S.2(2) Deeming — habitat**
- **(2)** For the purposes of this Act, the quantity, timing and quality of the water flow that are necessary to sustain the freshwater or estuarine ecosystems of a fish habitat are deemed to be a fish habitat.

Provincial Draft Surface Water Allocation Directive

- Applies to areas where no IO or WCO exists
- Policy focuses on cumulative withdrawals and establishing limits
 - <https://talkaep.alberta.ca/surfacewaterallocation>

Is the Water Act adaptive?

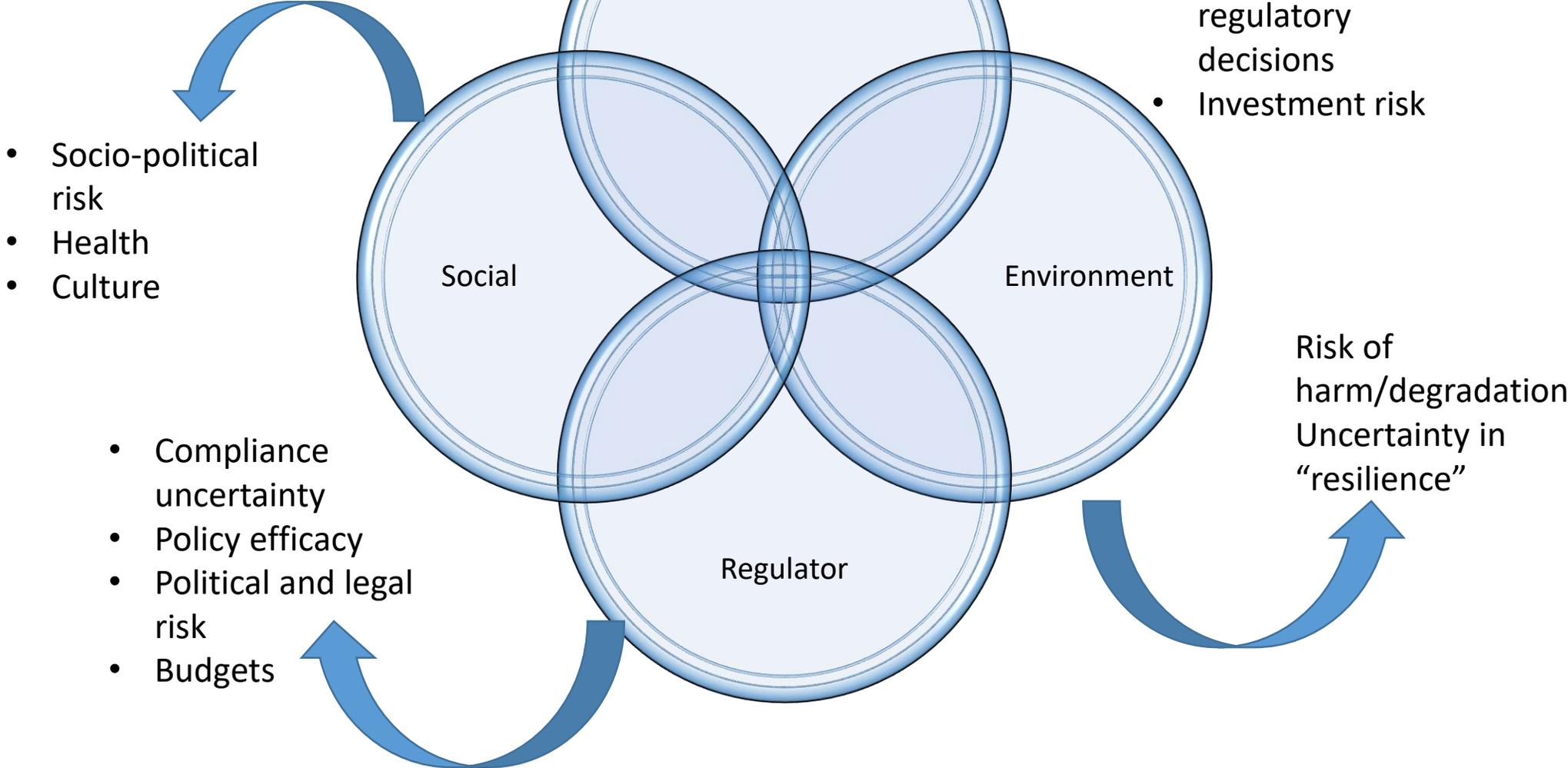
Pro-adaptive provisions

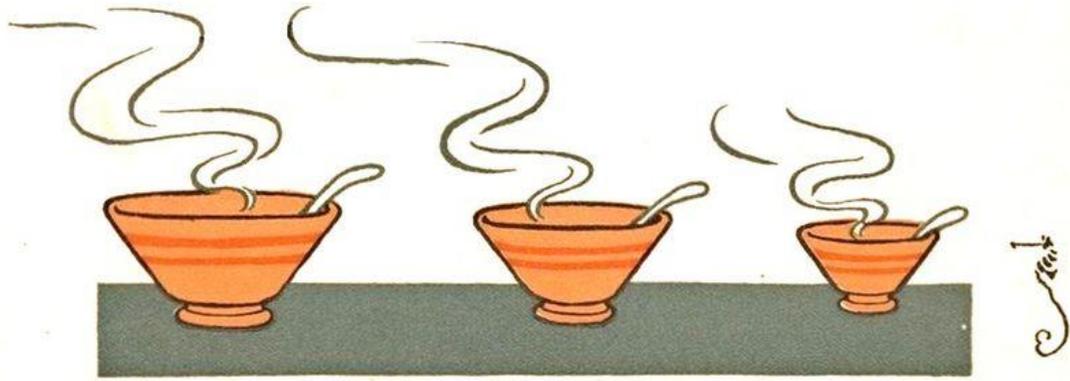
- Transfers and holdbacks –but #s and volume
- Water management plans –but haven't directed adaptive measures (beyond existing WA provisions)
- Renewal amendments possible but likely to be practically limited
- Assignments - but they are constrained
- Licence conditions have incorporated instream flow requirements but equity, enforcement (litigation risks) and transparency issues exist

Counter adaptive provisions

- Deemed licences
- FITFIR
- Amendment restrictions and need for compensation

Exercising discretion and lenses of
water management
private v. public
certain v. uncertain





Current water law and governance narrative – searching for “just right”

- Too hard – rights orientation (treatment as property) w/o adopting accountability measures for commons /public issues
- Too soft – collaborative planning (advisory) vs. co-management
- Too hot – the political will to change historic allocation rights, to adopt adaptive management and to realize resource use/degradation payments
- Too cold – Environmental and Indigenous rights are given a cold shoulder
- Lens of adaptation - we must return to taste the porridge on an ongoing basis whatever the risks.

Governance matters

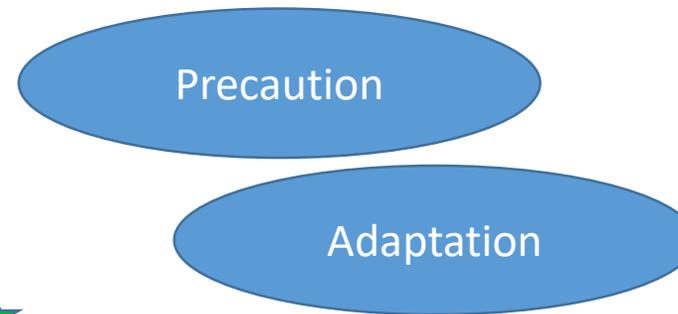
- Water law is trying to provide clarity and certainty to diverters
- Administrative law favors front-end decision making – not well suited to complexity and uncertainty
- Adaptation in law is clearly possible but typically relies on discretion
 - What operates to minimize exercising discretion in favor of the environment? Are there forces that push towards administrative stasis on environmental flow issues?
- To become adaptive, water law and policy must foster decentralized management and regulation (an evolution of common pool resource management theory)
- We try and act like water is both a private and public good without framing governance to serve both purposes, i.e. current governance model favours private rights and this is at odds with the flexibility that is likely to be needed moving forward

Adaptive?

- “How can legal frameworks transition toward adaptive governance without completely alienating the societal stakeholders who depend on stable legal systems for security?”
 - To maintain legitimacy and be nimble one needs
 - transparency,
 - inclusiveness,
 - fairness
 - accountability
 - Craig R.K. *et al* 2017 “Balancing stability and flexibility in adaptive governance: an analysis of tools available in US Environmental Law” *Ecology and Society* 22(2): 3

Governing around uncertainty: from CPR to Adaptive Governance

- Tragedy of commons
- Common pool resource (CPR) management --Ostrom, E.
 - Design principles (select)
 - User boundaries
 - Resource boundaries ★
 - Collective choice arrangements ★
 - Monitoring (users and resources) ★
 - Graduated Sanctions
 - Recognition of rights (to make rules) ★
 - Nested enterprises ★
 - One size doesn't fit all
 - Willing to deal with complexity instead of rejecting it
 - Beyond markets and States: Polycentric Governance of Complex Economic Systems, *American Economic Review* 100 (June 2012): 641-672.



Adapted from DeCaro, D. A., Chaffin, B. C., Schlager, E., Garmestani, A. S., & Ruhl, J. B. (2017). Legal and institutional foundations of adaptive environmental governance. *Ecology and society: a journal of integrative science for resilience and sustainability*, 22(1), 1-32

Design principle

Water Act approach

Reflexive

- Does not rely on static rules, e.g., fixed water allocations, when flexibility is needed.

Limited flexibility in deemed licences and prior allocation

Legal Sunsets

- Planned periods of comprehensive evaluation, in which environmental policies and agreements can be periodically examined, renegotiated, and potentially modified.

Planned evaluation of approaches not mandated

Legally Binding Authority

- Authority to make decisions and implement chosen solutions is institutionalized in binding legislation, for multiple centres of governance activity in polycentric society, e.g., agencies, communities, regional governments.

Community and regional water governance not legislated*

Legally Binding Responsibility

- Formal definition and assignment of responsibility to resolve, or contribute to resolution, of a social-ecological dilemma, or element thereof.

Social-ecological issues not defined or assigned. Implied in policy decisions.

Tangible Support

- Assistance from national, state, and local government, etc., in the form of dedicated and sufficient funds, technology, information, and training to meet one's legally binding responsibilities and pursue one's legally granted authority

Decentralized and advisory planning has ad hoc support

Legislative responses - Recent evaluations

- BC and Australia have both made strides in adaptive governance of water resources (quantity)
 - Deborah Curran and Sharon Mascher, “Adaptive Management in Water Law: Evaluating Australian (New South Wales) and Canadian (British Columbia) Law Reform Initiatives” (2016) 12: 2 *MJSDL*, online:
https://www.mcgill.ca/mjsdl/files/mjsdl/curran-mascher_0.pdf
- BC has made some headway (Curran & Mascher)
 - Licences adaptable (w/o compensation)
 - Environmental flows & mitigation requirements for significant adverse effects (prospectively)
 - Critical flow orders
 - Planning (w/ legal implications)

Overcoming administrative stasis in water law

- Decentralized rule making – through nested and integrated systems
 - Beyond an insular view of resource “users”
- Decentralized enforcement (i.e. accountability)
 - Public/private monitoring and enforcement opportunities needed
 - Transparency in IFN metrics and reporting
- Clarifying resource availability (i.e. resource boundaries)
- Back end procedural fairness assurances
 - Does this include compensation?

Final thoughts

- Are we prepared to move beyond front-end regulatory approaches?
- Precaution is important
 - Removes water for contentious tug of war
 - Bolster resiliency (moving from risks to values)
- Adaptive management in law is typically rife with discretion = muting concerns over certainty - this is by design
 - We need to get serious about adaptive management
- Administrative law principles and processes typically run into problems around fairness
 - Inclusivity and ongoing procedures are needed
- Water governance needs to evolve with more responsibilities to go along with rights

Recommendations

Policy

- Revisit strategy for the protection of the aquatic environment
- Assess water productivity and waste (guidelines)
- Increase transparency in water use
- Increase transparency in environmental reporting (IFN/IO/WCO)
- Guidance policy for using discretion on licence conditions
- Compensation policy

Water Act reforms

- Regional and community co-governance for water allocations
- Constrain discretion with water forecasting,
- Enable a water fee structure directly linking it to monitoring, planning and compensation policy

Questions?

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